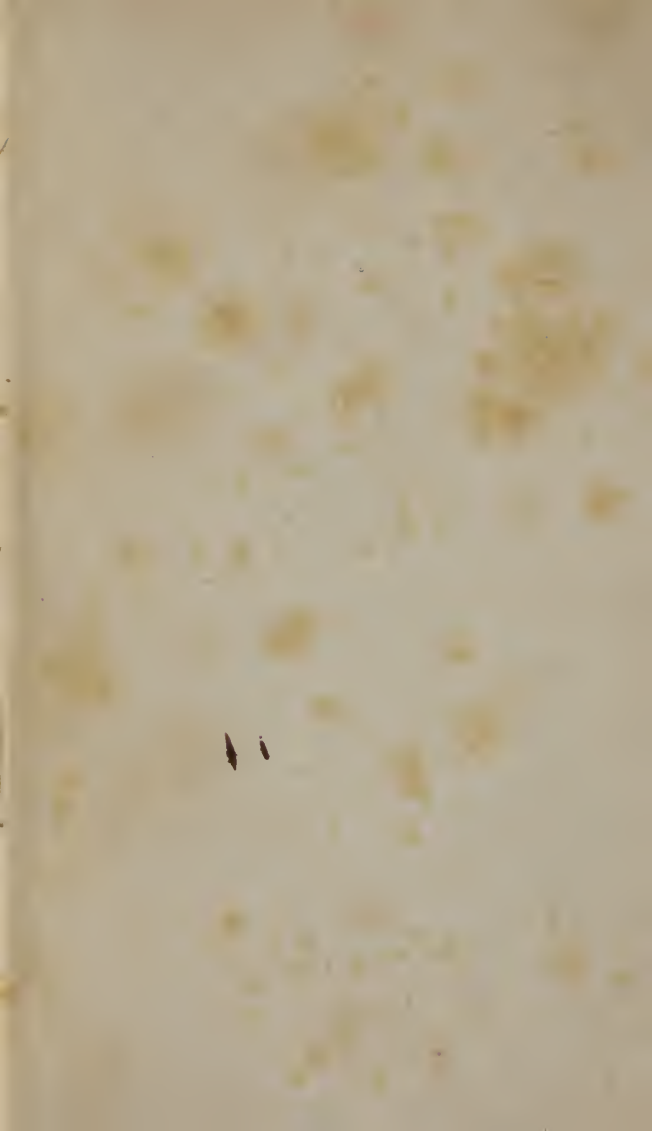


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INDEX.

**SIMPLIFIED ANATOMY,
FOR THE USE OF FAMILIES;**

AND

THOSE WHO HAVE NOT THE ADVANTAGE OF A TEACHER;

IN WHICH

THE DIFFERENT PARTS OF THE HUMAN SYSTEM ARE
EXPLAINED.

ILLUSTRATED WITH ENGRAVINGS

OF THE BONES, MUSCLES, BLOOD VESSELS, NERVES, &c.

TO WHICH IS ANNEXED,

A COPIOUS GLOSSARY.



BY

DR. WILLIAM SPILLMAN,
OF MARYVILLE, TENN.



“—— If a better system’s thine,
Impart it freely, or make use of mine.”



117077

Madisonville, Tenn.

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Entered according to act of Congress in the year 1835, by
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WM. C. MYNATT,
Clerk of the District of East Tennessee.

INDEX.



In presenting to the publick a new work, on a subject upon which so much has already been written; I have assumed it as granted, that it was necessary to state candidly the reasons why I was led to compile, and publish the following pages; and 1. There has been a great many books published, and circulated for the purpose of instructing people in general, as it regards the symptoms of disease, and the mode of administering medicine for the relief of the same:—and, almost every family is in possession of such books. How few derive any benefit from them, in consequence of being unacquainted with the construction of the human system—the location of the different organs.—and the parts liable to be affected by disease.

This then is one strong reason why a simple, plain anatomical work, adapted to the capacity of common readers should be published.

2. The second reason is that the most of anatomical, and physiological works that have been previously published are so lengthy, complicated, and full of technical terms, with explanations, that the common reader cannot be benefitted by them.

With these considerations, together with many others that might easily be adduced, I have endeavored to compile a work that will obviate the above difficulties.

The difficulties with which I met myself, when I first commenced reading anatomical works, from the frequent use of technical terms, without an explanation, caused me often to wish for a simple, plain work on that subject, such as was not too diffuse—not expressed in many words; but comprised in so moderate a compass as not to require any large expense, either of money or time: and this I wanted to see in the plainest dress, and in the most clear, easy, and intelligible manner, that the nature of things would allow of.

There are a great many books extant on anatomy and physiology, that are good, and useful, to the scientific, and which reflect much credit upon their different authors. But the query is, are they adapted to the capacity of common readers? If then, the negative is put upon this question, the fact is at once established, that a work on anatomy suited to the capacity of people in general is needed.

Such a work I have aimed at in the following pages. It is true, that many technical terms are used, but in most cases they are followed by an explanation, or if not immediately explained, an explanation can be found in the glossary at the sequel.

I have now only to add, that I have written and published this book because I believed that such an one was needed, and would be useful.

WM. SPILLMAN.

Maryville, Tenn. June 1st, 1835.

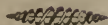
INDEX.



ARTICULATIONS in general,	51
Articulations of the head with the vertebræ,	55
“ “ “ vertebræ with each other,	“
“ “ “ lower jaw,	“
“ “ “ ribs,	57
“ “ “ clavicle,	“
“ “ “ shoulder,	58
“ “ “ elbow,	59
“ “ “ wrist,	60
“ “ “ hand,	61
“ “ “ fingers,	“
“ “ “ hip joint,	62
“ “ “ knee,	63
“ “ “ ancle,	64
Abdomen,	153
Aorta,	181
Arteries table of	182
Absorbents,	202
BONES of the head,	2
“ “ “ face and jaws,	10
“ “ “ ear,	17
“ “ “ trunk or body,	18
“ “ “ upper extremities,	28
“ “ “ lower extremities,	38
Bone of the ear,	16
Bones table of,	47
Bursæ mucosæ,	70
Bladder urinary,	164
Blood vessels,	173
Brain, spinal marrow and nerves,	189
CELLULAR membrane,	202
Explanation of plate I,	2
“ “ “ II,	48
“ “ “ III,	49
“ “ “ IV,	183
“ “ “ V,	194
GENERAL divisions,	1
“ integuments,	202
HEART,	150
INTESTINTS,	156
KIDNIES,	164
LIGAMENTS,	64
Larynx,	144
Lungs,	152
Liver,	155

MUSCLES in general,	78
“ of the integuments of the cranium,	80
“ “ “ eye lids,	“
“ “ “ eye ball,	81
“ “ “ nose and mouth,	82
“ “ “ ear,	85
“ “ “ lower jaw,	87
“ “ “ fore part of the neck,	88
“ between the lower jaw and os hyoides,	89
“ “ “ os hyoides and the body,	90
“ situated laterally between the lower jaw & bone XVI	92
“ “ about the cavity of the fauces,	93
“ “ on the back part of the pharynx,	94
“ “ about the glottis,	95
“ “ “ “ anterior part of the abdomen,	96
“ “ “ “ male organs of generation.	97
“ of the anus,	100
“ “ “ female organs of generation,	101
“ situated within the pelvis,	102
“ “ “ “ cavity of the abdomen,	103
“ “ “ on the anterior part of the thorax,	105
“ “ between the ribs, and within the thorax,	106
“ “ on the fore part of the neck,	“
“ “ on the back part of the neck,	107
“ of the upper extremities,	114
“ situated on the os humeri,	116
“ situated below the elbow joint,	118
“ “ on the hand,	123
“ of the inferior extremities,	126
“ situated on the thigh,	129
“ “ “ “ leg,	132
“ “ “ “ foot,	136
Mouth and throat, cavity of	141
NERVES table of	195
“ spinal,	196
“ cervicle,	198
“ dorsal,	“
“ sacral,	“
OMENTUM,	157
Organs of generation, male,	165
“ “ “ female,	171
PELVIS in general,	24
Pharynx,	145
Pleura, form of,	149
Pericardium,	“
Peritonium,	152
Panchreas,	161

SALIVARY GLANDS,	142
Stomach,	154
Spleen,	163
Skin,	202
TEETH,	16
Tongue,	141
Throat,	143
Tonsils,	"
Thorax,	147
" form of the cavity,	148
Trachea, or wind pipe,	151



ERRATA.

In consequence of not being present at the time of the printing of the following pages, a number of typographical errors have been made; some of which are here corrected: there are a few others of less importance, which the reader can correct himself. For ex. *u* is frequently used for *n* and *visa versa*. W. S.

Page 5 *pass squamosa* & *pass petrosa*, read *pars squamosa* &c
On the same page, for *hejoides*, read *hyoides*.

Page 7, 7th line from the bottom, for *sepimentum*, read *septum*.

Page 22, 9th line from the bottom, for XVI. read XXVI.

Page 2 for muscle III, read 111.

Page 29, 3d line from the top, for *gives* read *joins*.

Page 31 4th line from the top, for *back* read *beak*.

Page 37, 14th line from the bottom, for *when* read *where*.

Page 43, 14th line from the top, for *delloid* read *deltoid*.

Page 52, 12th line from the bottom, for *for syncurosus* read *syneurosus*.

Page 62, 4th line from the bottom, for *cravat*, read *curvat*.

Page 65, 4th line of the 3rd paragraph, for *fosciculi*, read *fasciculi*.

Page 70, 11th line from the bottom, for *perosteum*, read *periosteum*.

Page 72, 5th line from the top, for *ilumero* read *humero*.

Page 90, 14th line from the top, for *lipi* of the tongue, read *tip*.

Same page 9th line from the bottom, the same error occurs again.

Page 92, 2d line from the bottom, for *has petrosa*, read *pars*.

Last line of page 90, & first of page 100, for *integuments* of the penis, read *body*.

Page 103, 6th line from the bottom, for *distention* read *distribution*.

Page 105, 10th line from the top, for *fifty*, read *fifth*.

Page 108, 1st paragraph, for *Labisimus*, read *Lattisimus*.

Page 111 3d line from the top for *covered* read *curved*.

Page 161, 12th line from the bottom, for *semen* read *serum*.

Page 163, last line of the 2d paragraph, for *splenic* read *splenic*.

Page 195, & last line, for *esntient*, read *sentient*.

SYSTEM OF ANATOMY.



PART FIRST.—OF BONES.

Before entering into a description of the Anatomy of the human system, it probably would be necessary to lay down in the first place, the general divisions.

1. The *cranium*, or head;
2. The *trunk*, or body;
3. The *lower extremities*, or legs and feet.

SUBDIVISIONS.—The *trunk* or body, is divided into two cavities:

1. The *chest*, *thorax*, or breast;
2. The abdomen or belly : these two cavities are divided by a membrane, called the *midriff* or *diaphragm*.

There are also some other imaginary divisions of the *trunk* or body, which, as they sometimes are useful in describing the location of organs, and the seat of disease, I will here introduce them. Suppose a line drawn from the pit of the stomach down the centre of the abdomen; a second one across the abdomen about two inches above the *umbilicus*, or navel; and a third one the same distance below. We will then have the abdomen divided into six parts. A part of each of the two upper portions, included between the ends of the false ribs on each side, and the centre of the abdomen, is termed the *epigastric* region: and on each side of this are the right and left *hypochondriac* regions. Between the first and second transverse or cross lines, and two inches on each side of the navel, is called the *umbilical* region; immediately below is the *hypogas-*

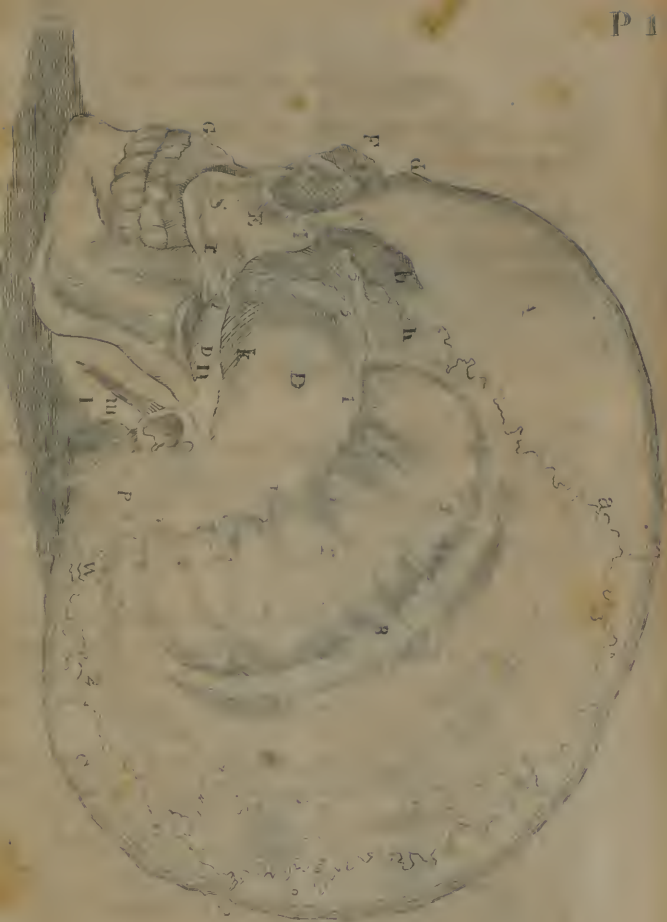
tric region; on either side the right and left *illiac* or *lumbar* region.

BONES.—There are in the human system 248 bones, 63 of which are found in the head. Plate first exhibits most of the bones of the head, together with the *sutures*.



EXPLANATION OF PLATE 1.

- A The frontal bone.
- a Shows the *serated edge* which forms the *coronal suture*.
- b The flatter part behind the eye, which is plain and hollow for lodging the temporal muscle.
- c Is the acute angle of the bone, called the external angular process.
- d Is the prominence over the nose, called the *frontal sinus*, which the Surgeon avoids in trepanning.
- B The parietal bone. The white semicircle line in which (B) stands, represents the origin of the temporal muscles.
- e Is that part covered with the thin expanded tendon of the *Occipito-frontalis muscle*; (Mus. 1.)
- f The radiated surface.
- g Points to a small hole in the back part of this bone.
- h That part called the *spinous process*, under the corner of which the *dura mater* runs.
- C A small part of the *occipital* bone.
- D The temporal bone.
- i The thin upper edge, which forms the *squamous suture*.
- k The deep flat part, on which the temporal muscle lies.





- l The *mastoid* or *mamilliary process*, named from its resemblance to a nipple.
- m The *styloid process*.
- n The *zygomatic process*, which, joining with a similar process of the cheek bone forms, the *zygoma*, or arch.
- o The ring of the *meatus auditorus externus*, or outward ring of the ears.
- p A small hole, which, transmits a vein.
- E *Os malæ*, or bone of the cheek.
- q The *angular process* of the cheek bone.
- r *Zygomatic process* of the cheek bone.
- s The origin of the *zygomaticus Muscles*; (see mus. 14 15.)
- F The *nasal bones*, or bones of the nose.
- t The *lateral nasal suture*, or part, where the bones of the nose, are joined to the upper jaw bone.
- G The upper jaw bone.
- H The under jaw bone. (H) is placed at the part called angle, into which the *maseter muscle* is fixed; (Mus. 36.)
- u The *coronoid* or horn-like process.
- v The *condyloid process*.
- 1 *Coronal suture*, running across the head, joining the frontal to the parietal bones, extending from ear to ear, it joins the *squamous suture* at the temple.
- 2 *Lamdoidal suture*, joining the occipital to the parietal bones.
- 3 *Sagittal suture*, joining the parietal bones to each other.
- 4 *Temporal or squamous suture*, belonging chiefly to the temporal bone, so called, because the temporal and parietal bones lie over each other like scales.
- w *Additamentum suturae squamosae* or supplement to

the *Squamous suture*, lying between the *occipital* and *parietal* bones.

5 *Sphenoidal suture*; It joins the wing of the sphenoid bone, to the temporal, frontal, and parietal bones.

6 *Transverse suture*; It runs across the face, through the middle of the eye sockets, and over the root of the nose.

7 *Zygomatic suture*.



BONES OF THE CRANIUM OR HEAD.

1. *Os Frontis*, or bone of the forehead. A shell like bone reaching from its upper edge downwards so as to include the upper part of the eye socket, and backwards on each side to the temples. The particular parts of this bone, are,

1. *Superciliary ridge*. Immediately above the eyes on which the eye brows are placed.

2. *Superciliary hole*. A hole on the ridge last described, which gives passage to the frontal nerve.

3. *Foramen orbitale internus*. A hole in the internal part of the eye socket, which also transmits a nerve.

4. *Angular process*. The *orbitaly* or *superciliary* ridge, ends by two processes, which forming the angles of the eye are named the angular processes. The frontal bone has 4 angular processes.

1. The two internal angular processes, forming the internal angles of the eye; and 2 the two external angular processes, which form the external angles of the eye.

5. *Nasal point or process*. The nasal or nose process is a small sharp projecting point, occupying the space between the two external angular processes.

6. *Temporal ridge or spine.* Extending from the external angular process, backwards and upwards.

II. *Os PARIETALE*, (or parietal bone.) The bones which form the walls on each side of the head. They are of a *quadrangular*, or square form. These bones enter into the formation of the *coronal*, *sagittal*, *lambdoidal*, and *squamous sutures*, (see plate 1.)

The parietal bones are joined together by the sagittal suture to the sphenoid, and temporal bones, by the lambdoidal, and to the frontal by the coronal suture.

III. *Ossa TEMPORALIA*, or temporal bones. They are situated on each side of the head and are divided into three portions, one of which from its connection with other bones, is called *pass squamosa* (i. e.) lie over each other like scales; the second *pass petrosa* or *os petrosum* from its irregularity and hardness; and the third is called *mastoidian angle*, it is thick and hard, and is divided into cells, forming those caverns which are supposed to be chiefly useful in reverberating the sound. The other particular parts of these bones are,

1. *Zygomatic process.* It arises broad and flat before the ear; grows gradually smaller as it stretches forward to reach the cheek bone, to which it is joined by a short suture.

2. *Styloid process*, so named because it resembles a *stylus* or point, with which the ancients engraved their writing on tables of wax. It stands obliquely out from the basis of the head, and is behind the jaws. It gives origin to a ligament that supports the *os hyoides* or bone of the tongue.

3. *Mastoid process*, or conical nipple-like bump, like the thumb; it projects from under the ear, and is easily felt with the finger.

4. *Auditory process.* The outer margin of the hole of the ear.

IV. *Os OCCIPITIS*. This bone is situated on the back part of the head, is very thick, and uneven. This bone supports the back part of the brain, contains the *cerebellum* or lesser brain, and transmits the spinal marrow.

This bone is united to the parietal, temporal, and sphenoid bones.—The different parts of this bone are,

1. *Perpendicular external spine*; An irregular spine, or ridge in the middle of the bone.

2. *Superior transverse spine*, or ridge across this bone, at the upper part.

3. *Inferior transverse spine*, or ridge across this bone at the lower part. These ridges give origin and insertion to several muscles.

4. *Posterior tuberosity*. The part where the superior transverse spine crosses the perpendicular spine or ridge, is thus named.

5. *Cuneiform process*, or wedge-like process. That part of the bone which lies in the center of the base of the skull, and is joined to the sphenoid bone.

6. *Condyles*. Two small oval processes, or button-like projections, which stand off from the side, a little back from the forepart of the *foramen magnum* or great hole.

7. *Tubercles*. On the lower part of the cuneiform process, there are two tubercles, for the attachment of muscles. Near the *condyle* and immediately behind the *foramen lacerum*, there is a tubercle for the attachment of another muscle.

8. *Foramen magnum*, or great hole of the head, which transmits the spinal marrow, or continuation of the brain.

9. *Foramen condyloideum anterius*. A hole at the fore part of the root of either *condyle*. It transmits the great lingual nerve.

10. *Foramen condyloideum posterius.* A small hole immediately behind the *condyle*. A vein passes through this hole.

11. *Foramen lacerum.* Formed by the occipital and temporal bones. It sometimes is divided into two openings, by a small point. This hole also transmits a nerve, which goes down to the heart, lungs and stomach.

V. *OS ETHMOIDEUM.* This, of all the bones of the human system is the most curious. It is exceedingly light and spongy, and consists of many *convoluted* plates. (i. e.) rolled or folded together, forming a net-work, like a honey-comb. This bone is curiously enclosed in the *os frontis*. (bone of the forehead,) betwixt the orbital plates of that bone.

This bone is connected to the frontal, sphenoid and vomer bones. The divisions or parts of this bone are,

1. *Cribriform plate.* This plate is exceedingly thin. lies horizontally over the root of the nose, and fills up the space between the two orbital plates of the frontal bone.

2. *Crista gali.* A small perpendicular projection, somewhat like a cock's comb, but very small, standing directly upwards from the middle of the cribriform plate, and dividing that plate so that one olfactory nerve lies on each side of this process.

3. *Nasal plate or process.* That part of the ethmoid bone which forms part of the *septimentum* or *partition* which divides the nostrils.

4. *Labyrinths.* The side parts of the ethmoid bone consist of small cells communicating with each other, which are called labyrinths. These cells are closed externally by a plate called, *os planum* (i. e.) plain and smooth.

5. *Superior spongy bones or processes.* From each of these labyrinths, there hangs down a *spongy bone* in each nostril. They are each rolled up like a scroll of parchment, and are covered with a sensible membrane, to which the olfactory nerves are attached after they depart from the cribriform plate.

6. *Os planum or orbital plate* of the ethmoid bone. It is of a quadrangular form, is very smooth, and forms a great part of the eye socket, lying in its inner side.

VI. *Os SPHENOIDES*, or sphenoid bone, which completes the cranium, and closes it below. It is also named *cuneiform*, or wedge-like bone, from its being enclosed in the very base of the skull. This bone is united to fourteen distinct bones. It is very much shaped like a bat, for which reason it is often named *pterygoid bone*; its temporal process being like extended wings, its *pterygoid process* like feet; its middle like the body and head of a bat. Its wing like processes, are in the hollow of the temple, forming part of the *squamous suture*, and also composing part of the eye socket; its *pterygoid* processes, hang over the roof of the mouth, forming the back of the nostrils; the body is the very center of the skull. The parts of this bone which are referred to in other places, are,

1. *Temporal process*, often called *alæ* or *wings*. It is situated in the temple, to form part of the hollow of the temple; and the wings of the sphenoid bone meeting the frontal, parietal, and temporal bones, by a thin scaly edge, they form part of the *squamous suture*, forming a smooth surface for the temporal muscles to play upon.

2. *Orbital process.* That part of the *sphenoid* bone which forms the outside of the eye socket. It is also called *orbital plate*.

3. *Cerebral fossa.* That portion of the wing which runs backwards, and receives the middle lobe of the brain is thus called.

4. *Temporal fossa.* That part of the sphenoid bone which receives the temporal muscle.

5. *Styloid process.* A small point projecting from the basis of the skull, just within the condyle of the lower jaw.

6. *Transverse spinous process.* A portion of the less wing, called *ingratias*, which projects laterally into a point, is thus named.

7. *Pterygoid processes.* They are four in number, two of which are on each side. They are those processes on which the bone naturally stands, and which, when we compare it with a bat, represents the legs; one of each side is named external, and the other is named *internal pterygoid process*.

Each *external pterygoid process* is thin and broad, and extends further backwards. Each *internal pterygoid process* is taller and more slender and not so broad. It has its end rising higher than the other, and tipped with a small hook, named the hook of the pterygoid process.

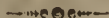
8. *Clinoid processes.* They are four in number surrounding the *sella turcica*; two of which are named from their position anterior, and the other two posterior. They are small bumps, rather sharp: the two called anterior, terminate in two flat points projecting backwards; the other two are round, or knotty at their points, projecting forward, toward the anterior clinoid process.

9. *Tuberculum olivare.* An eminence between the anterior clinoid process and before the *sella turcica*.

10. *Sella turcica ephippium*, or Turkish Saddle. A cavity in the sphenoid bone, containing the *pituitary*

gland. It is surrounded by the four clinoid processes.

There are many other holes, and parts of this bone which are worthy of notice, those wishing further information can find it in Bells' or Wister's anatomy.



BONES OF THE FACE AND JAWS.

VII. OSSA MAXILLARIA SUPERIORA, or upper jaw bones. The upper jaw bones are of considerable size, forming, as it were the bones of the face. They send a large branch upwards, which forms the sides of the nose; a broad plate goes backwards, which forms the roof of the palate. There is a circular projection below, which forms the *alveoli*, or sockets of the teeth. These processes, together with the cavity of these bones, deserve particular notice.

The surface or plates of this bone are these: external or *malar*; the superior or *orbital*; the internal, or *nasal*; the inferior or *palatine* surface.

The upper jaw bones are attached forward and upwards to the nasal and frontal bones; at the sides to the cheek bone, and in the orbit it is connected with the ethmoid bone; towards the nasal cavities, it has the vomer, palate bones, and lower spongy bones attached to it; and at the back part it touches the sphenoid bone. The parts to be noticed of this bone, are,

1. *Nasal* or nose processes, which extend upwards to form the sides of the nose. It is arched outwards to give the nostrils shape.

2. *Internal ridge.* On the inside and root of the nasal process, there is a rough horizontal ridge, which is named internal ridge, and which gives attachment to the fore part of the spongy bone.

3. *Orbitary plate.* That part of the bone which

forms the roof to the *antrum maxillare*, and serves as a floor for the eye to roll upon.

4. *Malar process*. That part of the bone which joins to the cheek bone.

5. *Alveolar process*. That part of the jaw bone in which the teeth are inserted.

6. *Palate process*. That part of the bone which divides the nose from the mouth, forming the roof of the palate, and the floor or bottom of the nostrils.

7. *Nasal spine or ridge*. Where the palate bones meet in the middle they form a ridge, which is thus called, on which ridge the split edge of the *vomer*, (bone 13) or partition of the nose, is planted.

9. *Antrum maxillare*, commonly called *antrum High morianum*, after its discoverer. The palate plate makes the floor of the antrum; the orbitary process makes its roof; the cheeks, from the sockets of the teeth to the lower part of the eyes, form its walls or sides. This cavity is lined with a membrane, subject to inflammation, and swelling, which very much deforms the face, but may be relieved by extracting the second or third of the grinding teeth.

VIII. *OSSA MALORUM*. These are the prominent square bones which form the upper part of the cheeks. They are situated close under the eyes, and make part of the orbit. Each of these bones have three surfaces to be considered. One of these is exterior, or outward surface, and is somewhat convex. The second is the upper surface, and is concave, serving to form the lower and side parts of the *orbit* or eye socket. The third is the posterior or back surface, which is very unequal and concave, for the lodgment of the *temporal muscle*, (mus. 35.)

Each of these bones have four processes.

1. *Upper orbitary process*, Running upwards to

form part of the eye socket, the outer corner of the eye, and the sharp edge of the temple.

2. *Lower orbitary process.* That part which forms the lower part of the eye socket, and the edge of the cheek.

3. *Maxillary process.* That part which forms the broad and rough surface, by which it is joined to the upper jaw bone.

4. *Internal orbitary process.* That portion which goes backwards to form part of the eye socket.

IX. *OSSA NASI.* or bones of the nose. They are each of an irregular oblong figure, being broadest at their lower ends, narrowest near the middle, and larger again at the top, where the edge is rough and thick, by which their connection with the frontal bone is very strong. They are convex externally, and concave within. They are enclosed by a branch of the upper jaw bone, which, stretching upwards, is named its nasal process; they lie with their edges under it, in one part, and above it, in another, in such a way that they cannot be easily forced in. The lower edge is rough, for the firm attachment of the cartilages of the nose; and their lowest point, on that part where the bones of the nose, and the gristles of the nose are joined, is the most prominent part of the nose. The only point resembling a process in these bones is, that rough ridge formed by their union, which projects towards the cavity, to give attachment to the nasal plate of the ethmoid bone.

X. *OSSA UNGUIS.* So named from its being of the size and shape of the nail of the finger. They are situated on the internal side of the orbit of the eye, between the *os planum* of the ethmoid bone, and the nasal process of the upper jaw bone. Each of these bones are joined above to the frontal bone; behind

to the os planum; before and below to the upper jaw bone.

The *Unguis*, is very thin and delicate, sometimes not thicker than a thin sheet of paper. It is this bone which is pierced in the operation of the *fistula lachrymalis*, a disease of the *lachrymal sack*.

This bone is liable to decay, which is perhaps, the nature of all thin bones, for as they have no marrow, they must depend entirely on the *periosteum* or membrane which surrounds the bones, for their blood-vessels, of which, they are no sooner deprived, than they die.

XI. OSSA PALATI, or palate bones: These bones form the back part of the roof of the mouth, extending from it along the external sides of the back opening of the nose, into the orbits of the eyes.

Each bone may be considered as follows;

1. *Palate plate*, or process of the palate bone. This process, lies horizontal in the same level with the *palate process* of the upper jaw-bone, which it resembles in its rough and spinous surface.

2. *Pterygoid process*: A small projecting point of the palate bone, just behind the last grinding tooth, touches the *pterygoid process* of the sphenoid bone; from which circumstance it is called *pterygoid process* of the palate bone.

3. *Nasal plate*, or process: This is a thin single plate, running perpendicularly upwards from the palate; and lies upon the side and back part of the nostrils, so as to form their opening backwards into the throat; it is so joined to the upper jaw-bone, that it lies there like a sounding board upon the *antrum maxillare*, (see bone VII part 9,) and completes that cavity forming the thin partition between it and the nose.

4. *Orbitary plate*, or process: That part of the na-

sal plate which enters into the orbit, and enlarges into an irregular knob, of a triangular form is called, *orbital process*.

XII. OSSA SPONGEOSA, or *tubinata inferiora*, resembling a sponge. They are two in number. situated in the under part of the side of the nose. They are thus named to distinguish them from the upper spongy bones, which belong to the ethmoid bone.

The *ossa spongiosa*, are convoluted, or rolled together, having such holes, cavities, and net work as we see in raised bread. They lie rolled up in the lower part of the nose, and are easily seen, either in the entire subject, or in the naked skull. Their points form that projection, which we feel with the finger in picking the nose, which from the indecency of the practice, as well as the danger attending it no person should ever be found at it; for in many instances, *polypi* of the lower spongy bones, may be traced to hurts inflicted by the finger nail.

Each of these bones is attached to the upper jaw-bone, near the transverse ridge, by a hook-like process.

XIII. VOMER. The nose is completed by the *vomer*, which is named from its resemblance to a plough share, and which divides the two nostrils from each other; it is a thin and slender bone, consisting of two plates, much compressed together, very dense and strong, but still so thin as to be semi-transparent. The plates of which the vomer is composed, split or part from each other at every edge, so as to form a groove on every side.

1. On its upper part, or as we may call it, its base, by which it is fixed to the skull, the *vomer* has a wide groove, receiving the projecting point of the ethmoid and sphenoid bones, so that it has a very firm and se-

cure attachment, capable of resisting violent blows.

2. Upon its lower part, its groove is narrower, and receives the rising line in the middle of the palate plate, where the bones meet to form the palate sutures.

3. At its fore part, it is united by a ragged surface, and by something like a groove to the middle cartilage of the nose.

XIV. OS MAXILLE INFERIORIS, or lower jaw-bone, which is formed like a horse shoe.

The lower jaw is divided into the chin, the base, or sides, extending backwards to the angle, and the upright portion of the bone. The parts of this bone to be noticed, are,

1. *Coronoid process*, so called from its resemblance to a crow's beak. This process is at the upper end of the upright portion of the jaw-bone, lying immediately under the *zygoma* or temporal arch:

2. *Condylloid process*; The articulating process of the lower-jaw.

The condyle, or articulating head, is not round, but flat, of a long form, and set across the branch of the jaw. This process is received into a long hollow of the temporal bone, just under the root of the *zygomatic process*.

3. *Alveolar process*, or sockets for the teeth, resembling that of the upper jaw. When you have acquired their full size, the sockets are completely filled. But, in the decline of life the teeth fall out, and the sockets are re-absorbed, and carried clean away, as if they had never existed.

4. *Semilunar notch*, the half-moon-shaped notch between the *coronoid* and *condylloid processes*.

OF THE TEETH.

XV. TEETH. There are thirty-two teeth in the adult skull, sixteen of which are in each jaw. These are divided into classes, according to their form and use, as follows;

1. *Incisors*, or front teeth: There are eight incisor teeth, four of which are in the upper, and four in the lower jaw.

2. *Cuspidati* or *canine teeth*; They are four in number, two of which are in the lower, and two in the upper jaw; they are situated between the fore, and grinding teeth.

3. *Biscuspides*, or lesser grinding teeth: They are eight in number, four of which are in each jaw. They are situated between the *cuspidati*, and large grinding teeth.

4. *Malares* or *grinding teeth*; There are six of these in each jaw, one of which is equal to four of the second class.



BONE OF THE TONGUE.

XVI. Os HYOIDES, or bone of the tongue: This bone is situated at the root of the tongue, between it and the larynx. In describing this bone it may be distinguished into its body, horns, and appendices.

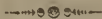
1. The *body* is the middle and broadest part of the bone, so placed that it may be easily felt with the finger in the fore part of the throat.

2. The *cornua*, or horns, which are flat, and a little bent, are considerably longer than the body of the bone. At the extremity of each of these horns, there

is a round tubercle, from which a ligament passes to the thyroid cartilage.

3. The *appendices*, or small bones, are two small processes, which in their size and shape, are somewhat like a grain of wheat. They rise up from the articulations of the *cornua*, or horns, with the body of the bone, and are connected on each side by a ligament to the styloid processes of the temporal bone.

The *os hyoides* serves to support the tongue, and affords attachment to a variety of muscles, some of which perform the motions of the tongue, while others act on the larynx and fauces.



BONES OF THE EAR.

XVII. *MALLEUS*. or hammer: a bone of the internal ear is so termed from its resemblance to a hammer. It is distinguished into a head, neck, & manubrium.

1. The *head* is round, and incrusted with a thin cartilage, and annexed to another bone of the ear, the *incus*, has a connection called *ginglymus*.

2. The *neck* is narrow, situated between the head and manubrium, or handle; from which a long slender process arises, which adheres to a furrow in the auditory canal.

3. The *manubrium* or handle is terminated by an enlarged extremity, and connected to the membrane of the internal ear, by a short coronoid process.

XVIII. *INCUS*, so named from its likeness to a smith's anvil. This is the largest, and strongest of the bones of the internal ear. It is divided into a body, and two crura or origins.

1. The *body* is situated *anteriorly*, or behind, is rather broad and thick, and has two eminences, & two

depressions, both covered with cartilage, and intended for the reception of the malleus or hammer.

2. Its shorter *crus*, or leg extends no farther than the cells of the mastoid *apophysis* or process.

3. Its longer *crus*, or leg together with the manubrium, or handle of the malleus, or hammer, to which it is connected by a ligament, is of the same extent as the shorter; but its extremity is carried inwards to receive the *os orbiculare*, (bone 20,) by the intervention of which it is united with the stapes, (bone 19.)

XIX. STAPES. A bone of the internal ear, so called from its resemblance to a stirrup.

XX. OS ORBICULARE. A small bone of the internal ear, not larger than a pin's head.



BONES OF THE TRUNK OR BODY.

XXI. VERTEBRÆ also called spine, from certain projecting points of each bone, which stand outwards in the back, forming a continued ridge. This long line consists of twenty-four distinct bones named *vertebæ*, from the latin *vertere*, to turn. They conduct the spinal marrow, secure from harm, the whole length of the spine, and support the whole weight of the trunk, head, and arms.

1. The *body* of the *vertebræ* is a large mass of soft and spongy bone; it is circular before, & flat on the sides. It is hollowed into the form of a crescent behind, to give the shape of that tube in which the spinal marrow is contained. The body is tipped with a harder & prominent ring above and below, as a sort of defence; and within the ring, the body of the *vertebræ* is hollowed out into a sort of superficial cup, which receives the ligamentous substance, by which the two next

vertebræ are joined to it; so that each vertebra goes upon a pivot, and resembles the ball and socket joint.

The body is the main part of the vertebra, to which all the other processes are to be referred; it is the center of the spine and bears chiefly the weight of the body: It is larger in the loins, smaller in the back, and in the neck there is scarcely any body at all, being joined to each other chiefly by the articulating processes.

2. *Articulating or oblique process.* This is a small projection, standing out from the body of the vertebra, with a smooth surface, by which it is joined to the articulating process of the next bone. The upper ones are named the *ascending oblique processes*, and the two lower ones are named the *inferior or descending oblique processes*.

3. *Spinous processes*, are those which project directly backwards, the points of which form the ridge of the back.

The body of each vertebra sends out two arms, which, meeting behind, form an arch or canal for the spinal marrow: and from the middle of that arch, and opposite to the body, the spinous process projects. The spinous, and transverse processes, are as so many levers by which the spine is to be moved.

4. *Transverse processes.* These stand out from the sides of the arms, or branches which form the arch. They stand out at right angles, or transversely from the body of the bone—these processes serve for the attachment of muscles, and also as levers to assist in the motion of the spine in general.

The vertebra is divided into *cervical, dorsal, and lumbar vertebrae*.

1. *Cervical vertebrae*, or bones of the neck. They

are seven in number. Their bodies are small, but of a firmer texture than those of the back and loins.

2. *Dorsal vertebræ*, or bones of the back. They are twelve in number. The bodies of these bones are more flattened at their sides, more convex before, and more concave behind than the other bones of the back. To each of the vertebra of the back, a right and left rib is attached, not only to the body of the *vertebræ*, but also to the transverse process, by a ligament.

5. *Lumbar vertebræ*, or five inferior or lower bones of the spine. They are larger than the *dorsal vertebræ*. Their bodies are more prominent, and nearly of a circular form at their front part: posteriorly, or behind they are concave.

XXII. *Os sacrum*. The *os sacrum*, derives its name from the circumstance of its being offered in sacrifice by the ancients, or perhaps from its supporting the organs of generation, which they considered as sacred. Its shape has some resemblance to an irregular triangle. This bone is joined above to the last lumbar vertebra; at its sides, it is firmly united by a broad irregular surface to the hip bone, and below to the *os coccyges* (bone 23.) In women this bone is shorter, and more curved than in men, by which means, the cavity of the pelvis is more enlarged.

XXIII. *Os coccyges*, so named from its resemblance to the beak or bill of a cuckoo. This bone is a small appendage to the *os sacrum*, (bone 22,) terminating with an inverted column: it contracts the lower opening of the pelvis, so as to support the rectum, bladder, and womb: and yet continues so moveable in women, as to recede in time of labor.

XXIV. *Ossa innominata*, or nameless bones. These are the two large irregular bones, forming the sides of the pelvis, which have a form so difficult to ex-

plain by one name, that it will be necessary to divide them into three parts, and explain each one as three distinct bones, by the names of *os ilium*, *os ischium*, and *os pubis*.

The *os ilium* or haunch bone, is that broad and expanded bone, on which lie the strong muscles of the thigh, and which forms the rounding of the haunch. The *os ischium* or hip bone, is the lowest point of the pelvis, on which we rest in sitting. The *os pubis* or share bone, is that part on which the privates are placed. All these bones are divided in a child; they are united in the centre of the socket for the thigh bone; and we find in a child a thick cartilage or gristle in the center of the socket, which cartilage forms a prominent ridge of bone in the adult, to which a strong ligament from the caput, or head of the thigh bone is fastened.

XXV. *Os ILIUM*, or haunch bone, so named from its forming the flank. It is the largest part of the *os innominatum*. This bone rises upwards from the pelvis in a broad expanding wing, which forms the lower part of the cavity of the abdomen, and supports the chief weight of the impregnated womb. This flat part is named the *ala*, or wing; while the lower, or round part, is named the *body* of the bone, where it enters into the socket, and meets the other bones.

1. *Ala* or wing, the flat part of the *os ilium*.
2. *Spine*. A ridge of firm bone, situated on the edge of the circle of the wing. In a child this circular ridge is a cartilage, but becomes ossified in ripper years. This spine or ridge gives origin to several muscles.
3. *Spinous procsss*. The two ends of the spine last described are abrupt, and the points formed upon it, are

named spinous processes, of which there are two at its fore, and two at its back end. The two *posterior* or back *spinous processes* are close to each other, and are merely two rough prejecting points near the rough surface, by which the *os ilium* is joined to the *os sacrum*. Where the spine terminates in this process the great muscle of the hip, the *gluteus maximus*, (mus. 170) takes its rise. The two *anterior*, or fore spinous processes are more distinct. One of which is called the *anterior superior spinous process*, is the abrupt ending of the spine or circle, of the *os ilium*, with a swelling out; from which process two muscles of the thigh arise; (Mus. 176, 177,) and also a ligament, which passing from the *os ilium* to the pubes, or front point of the pelvis, is called the ligament of the thigh. The other process called the *inferior anterior spinous process* is a small lump about an inch below the first one. This process also gives origin to a muscle of the thigh (mus. 178.)

4. *Linea innominata*. The acute line, which is thus named, is seen upon the internal surface of the bone, divides the *ala*, or wing, from that part which forms the true pelvis. This line composes part of the brim of the pelvis, and distinguishes the cavity of the pelvis, from the cavity of the abdomen.

XVI. *Os ischium*, or hip bone. This bone is placed perpendicularly under the *os ilium*, and is the lowest point of the pelvis upon which we sit. It forms the largest share of the socket, in consequence of which, the socket is named *acetabulum ischii*, as peculiarly belonging to this bone. The parts of this bone to be noticed, are,

1. *Body*. This is the uppermost and thickest part of this bone, which helps in forming the socket.

2. *Spinous process.* This process arises from the body of the *ischium* and projects backwards, pointing towards the *os sacrum*, and receives the uppermost of the two long ligaments, which, from their passage betwixt the *ischium* and *sacrum*, are named *sacra-sciatic*.

3. *Sacra-sciatic hole.* A semi-circle of the *ischium*, just below the joining of the *ilium* with the *sacrum*, is thus named.

4. *Tuber*, or round knob. This is the part on which we rest. This bump is a little flattened where we sit upon it. It is the mark by which the lithotomist directs his incision, cutting exactly in the middle, betwixt the anus and this point of the *ischium*.

5. *Cervix.* A smooth surface between the tuber and socket of the hip joint. This smooth surface is a little depressed and covered with a cartilage which allows the tendon of the obturator (*Mus. 34*,) to move easily.

6. *Ramus*, or branch. This portion of the *ischium*, rises obliquely upwards and forwards, to join a like branch of the *pubis*. This branch, or arm, as it is called, is flat, and is turned a little forwards and backwards; so that one edge forms the arch of the *pubis*, while the other edge forms the margin of the thyroid hole.

XXVII. *Os PUBIS*, or share bone, is the last and smallest piece of the *os innominatum*, and is named from the *mons veneris* (or triangular eminence immediately over the middle of the *os pubis* of women, that is covered with hair) being placed on it. It forms the upper, or fore part of the pelvis, and completes the brim of the pelvis. The parts of this bone to be noticed, are,

1. *Body.* The body of the *os pubis* is thick and strong, and forms about one fifth of the socket of the

thigh bone. It is not only the smallest, but the shallowest part of the socket.

2 *Ramus* or branch; The ramus is that more slender part of the pubis, which, joining with the branch of the ischium, forms with it the arch of the pubis, and the edge of the thyroid hole.

3. *Linea innominata*. On the middle of the pubes there is a process which is frequently called *tuberos angle*: from this process there are two ridges traced; one goes to meet the line on the ilium, forming the brim of the pelvis; the other goes down towards the edge of the thigh socket; these ridges are called *linea innominata*.

THE PELVIS IN GENERAL.

There are other parts of the pelvis which are worthy of a notice in this place as they will frequently be referred to. They are,

1. *Promontory of the sacrum*. This is the projection formed by the lowest vertebra of the loins, and the upper point of the os sacrum.

2. *Hollow of the sacrum*. This is all that smooth inner surface which gives out the great nerves for the legs of the pelvis.

3. *Lesser angle*. This is a short turn in the sacrum near where it is joined with the os occygis.

4. *Crest of the pubes*. This is a short ridge, or edge of the bone over the joining of the *symphysis pubes*.

5. *Posterior symphysis of the pelvis*. The part where the os sacrum is joined with the os ilium is thus named.

6. *Anterior symphysis of the pelvis*. The front part where the two share bones are joined is thus named.

7. *Acetabulum*, so named from its resemblance to a

measure which the ancients used for vinegar. The hollow or socket for the thigh bone, composed of the *ilium*, *ischium* and *pubes*. On the lower part of the margin of this socket there is a deficiency of bone which, however, is made up by a ligament, and yet not so perfectly, but that dislocation of the head of the thigh bone sometimes takes place in this direction.

8. *Brim of the pelvis.* The brim of the pelvis is that oval ring, which parts the cavity of the pelvis from the cavity of the abdomen; it is formed by continued line along the upper part of the sacrum, the middle of the *ilium*, and the upper part of the crest of the *pubes*. This circle of the brim supports the impregnated womb, keeps it up against the pressure of labour pains.

9. *Outlet of the pelvis.* The outlet of the pelvis, is the lower circle, composed by the arch of the *pubes*, and by the *sciatic ligaments*, which is wide and capable of being dilated, to permit the delivery of the child's head to press so suddenly, and with such violence upon the soft parts, that the perenium, or part between the anus and organs of generation is torn.

10. *Thyroid hole.* The thyroid hole is that remarkable vacancy in the bone, which perhaps lightens the pelvis, or perhaps allows the soft parts to escape from the pressure during the passage of the head of the child.

XXVIII. *Os PECTORIS, OR STERNUM.* The breast bone. The breast bone is an oblong squared bone, which lies on the fore part of the breast, over the heart, and which, with the ribs and spine form the cavity of the thorax. At each upper corner, it joins the collar-bone, *laterally*, or on each side, several of the ribs are attached by cartilages or gristles.

In a child the *sternum* consists of eight distinct pieces, which fasten together in the progress of life, and which, in old age are firmly united in one. In the middle stages of life, we find three pieces in the sternum, two of which, are properly bone, and the third remains a cartilage until old age, and is named *ensiform* cartilage, from its sword like point. It is attached to the lower end of the sternum.

1. *Triangular portion*, or upper part of the sternum. This part of the sternum is large, roundish, or rather triangular, resembling a heart on playing cards: it is about two inches in length, and an inch and a half in breadth. The *apex* or point of the *triangle*, is pointed downwards, to meet the second bone of the sternum. The *base* of the *triangle*, which is uppermost, towards the throat seems a little hollowed, for the passage of the *trachea* or wind-pipe. On each upper corner, it has a large articulating hollow, into which the ends of the collar bones are received. The first rib, together with one half of the head of the second, is articulated to the side part of this bone.

2. The second piece of the sternum, is of a squared form, very long and flat, composing the chief length of the *sternum*; for the first piece receives only the cartilage of the first rib, and one half of the second; but this long piece receives on each side or edge of it. the cartilages of eight ribs; but as the three lower cartilages are run into one, there are but five sockets or marks in it.

3. *Ensiform cartilage*. This cartilage is attached to the lower end of the sternum, or breast bone, and extends downwards between the false ribs, giving sure origin, and great power to the muscles of the abdomen.

XXIX. COSTÆ, or ribs. The ribs are the long curved bones, which are placed in an oblique direction at the sides of the *thorax*, or breast. Their number is twelve on each side, seven of which are called true, and five false ribs. The use of the ribs is to give form to the thorax, to cover and defend the lungs, and heart, and also to assist in breathing, by yielding, and returning again when the muscles cease to act.

The ribs are in general, of a flattened form, their flat and smooth sides, being turned towards the lungs. But this flatness of the ribs is not regular; it is contorted, as if the rib had been taken by each end, and twisted: the meaning of which is, to accomodate the flatness of the rib to the form which the thorax assumes in all its degrees of elevation; for when the rib rises, and during its rising through all its degrees of elevation, it still keeps its flat side towards the lungs. Although the rib is of a flat form, yet it is a little rounded at its upper edge, and sharp at its lower edge. On each rib we find the following parts:

1. *Head* or round knob by which it is joined to the spine. The head of each rib has but a small articulating surface; but that smooth surface is double, or looks two ways. The head of the rib is not implanted into the side of one vertebra, but rather into the *intervertebral substance*, consequently, the head touches two of the vertebræ, therefore all the vertebræ of the back bear the the mark of two ribs except the first and last.

2. *Cervix*, or neck. The neck of the rib is the smallest part, immediately before the head. In this part the rib is small and round.

3. *Tubercle*, or bump. This bump is situated about an inch from the head, and is the articulating surface, by which it touches and turns upon the *transverse pro-*

cess of the vertebra below.

4. *Superior tubercle.* This is situated just above the tubercle last explained, but has nothing to do with the joints: it is intended merely for the attachment of the ligaments and muscles from the spine which suspend and move the ribs, and for the attachment of the anterior slips of the *longissimus dorsi*. (Mus. III.)

5. *Angle.* The angle of the rib is often mentioned, being a common mark of surgical operations. There is a flatness of the thorax behind, forming the breadth of the back; the sharpness where this flatness begins to turn into the roundness of the chest, is the place called the angles of the ribs. In these angles the *sacro-lumbalis* (Mus. 100) is inserted.

6. *Motion of the ribs.* By the motion of the ribs, the thorax is alternately dilated, and diminished in capacity, the lungs thereby having their play. A rib has two motions; 1st. Its back end rises and falls, the centre of motion being in the articulation with the spine. 2nd. It moves on its own axes; a line drawn through the two extremities, is the centre of its motion. The first motion, enlarges and diminishes the diameter of the thorax, from the spine to the breast bone. The second enlarges the lateral or side diameter of the thorax. By understanding the motion of the ribs, we can more easily determine when a rib is broken, or dislocated.



BONES OF THE UPPER EXTREMITIES.

XXX. CLAVICLE, or collar bone, so named from its resemblance to an ancient key. The clavicle is placed at the upper part of the breast; it extends across

from the tip of the shoulder, to the upper part of the breastbone; it is a round bone, flattened towards the end, which gives the *scapula* or shoulder blade; it is curved like an italic *f*, having one curve turned towards the breast. This bone is useful as an arch supporting the shoulders, and preventing them from falling forwards upon the breast. The end of the collar bone next the breast bone is round and flat, or button-like, the articulating surface is triangular, and is received into a suitable hollow on the upper piece of the breast bone. The outer end of the *clavicle* is flattened as it approaches the shoulder blade, and the edge of that flatness is turned to the edge of the flattened *acromion*, or process of the shoulder blade, so that they touch but in one single point; this outer end of the collar bone, and the corresponding point of the shoulder blade, are flattened, and covered with a cartilage. The motion at this point is very slight and insensible. This bone is liable to be fractured, and requires some care and management to set it right.

XXXI. *Scapula*, or shoulder blade. This bone is of a triangular figure, situated on the upper and back part of the thorax, and is joined to the collar bone and os humeri, or bone of the arm. The parts of this bone to be noticed are. 1st, *Superior costa*, or rib of the *scapula*. The edge or angle of the *scapula* is thus named. On this upper edge there is a notch, through which a nerve, and sometimes an artery passes, named *semilunar notch*.

2. *Inferior costa*, or lower edge of the *scapula*. It gives origin to two small muscles.

3. *Glenoid* or *articulating cavity*. The cavity or socket, which receives the head of the arm bone is thus named.

The shoulder blade towards this point terminates in

a flat surface, not more than an inch in diameter, very little hollowed, scarcely receiving the head of the os humeri, or bone of the arm, which is rather laid upon, than sunk into it: it is deepened a little by a circular gristle, which tips the edges or lips of this articulating surface, but so little, that it is still very shallow and plain. in consequence of which luxation is very common in the shoulder joint.

4. *Neck of the scapula.* Immediately behind the glenoid cavity, is a narrow part called the neck.

5. *Spine of the scapula,* is that high ridge of bone which runs the whole length of its surface, and divides it into two parts, for the origin of the *infra* and *supra* spinatous muscles, (Mus. 125, 126.) This ridge is high and very sharp, standing up in one place to the height of two inches. It is flattened at the top, and with edges, which, turning a little towards either side, gives rise to two strong *faciæ* or tendinous membranes, which go from the spine, to the upper and lower borders; so that by these strong membranes, the *scapula* is divided into two triangular cavities. The spine traverses the whole of the back of the scapula.

6. *Acromion process.* The spine beginning low at the basis of the scapula, gradually rises as it advances forwards, till it terminates in that high point or promontory which forms the tip of the shoulder, which overhangs and defends the joint. This high point is named the acromion process. The acromion prevents luxation of the shoulder joint upwards, and is so far part of the joint, that when it is full under the acromion, the joint is safe, but when it is hollow, so that the points of the fingers can be pushed under the acromion process, the shoulder is luxated, or out of joint.

7. *Coracoid process.* This process arises from the neck of the scapula, almost from the border of the

socket. It is a short, thick, and crooked process, standing directly forwards: and which, turning forwards with a crooked and sharp point, somewhat like the back of a crow, is thence named the *caracoid process*. This process also guards and strengthens the joint, and serves for the attachment of three different muscles, (Mus. 93, 130, 132.)

XXXII. *Os HUMERI*, or shoulder bone. This is a long cylindrical bone, situated between the elbow joint and shoulder blade. In order to distinguish this bone from the bones of the arm below the elbow joint, it will hereafter be called the upper bone of the arm. The parts of this bone, are,

1. *Head*. The head of this bone is very large, and of a very regular circle. This head is articulated to the shoulder blade.

2. *Neck*. The neck of this bone is nothing more than a roughness, close to the head, to which, the capsular ligament is attached.

3. *Tuberosities*. The tuberosities of the *os humeri* are two small bumps, which stand up at the upper end of the bone, just behind the head. The upper one of these is called the *greater*, & the lower, *lesser tuberosity*. Muscles 125 & 6 are inserted into the greater tuberosity, while the lesser only receives Muscle 131.

4. *Groove*. The groove is situated between the two tuberosities; in it the long tendon of the biceps muscle of the arm runs.

5. *Ridges*. On the outside of the groove there is a long ridge for the insertion of a muscle, and on the out side another one for the attachment of muscle 103.

6. *Condyles*. The *os humeri* at its lower part changes its form, is flattened and spread out to two inches in breadth; where there is formed on each side a sharp

projecting point called *condyles*, for the origin of muscles.

7. *Articulating surface*.. The articulating surface which stands between these condyles, forms a more strict hinge than can be easily conceived, without examining it. The joint consists of two surfaces; first, a smooth surface, upon which the *ulna*, or bone of the lower arm moves, as on a hinge; and secondly, of a small knob upon the outside, *trochlea* or pulley, which has a neat round surface, upon which the face or socket belonging to the button-like end of the radius or bone of the lower arm rolls. Those two surfaces are called, the one the small head, and the other the cartilaginous pulley, or trochlea of the humerus. Belonging to this joint, and within its capsular ligament, there are two deep hollows, which receive certain processes of the bones of the fore arm, one deep hollow on the fore part of the *humerus*, and just above its articulating pulley, receives the *coronoid*, or horn-like process of the *ulna* or bone of the fore arm; the other receives the *olecranon*, or that process of the *ulna* which forms the point of the elbow.

XXXIII. *Ulna*, or large bone of the fore arm. It is smaller and shorter than the one last described, and becomes gradually smaller as it descends to the wrist, and is of a triangular form. The parts of this bone, are,

1. *Sigmoid cavity*. The part of this bone which forms the hinge-like joint with the upper bone of the arm is named greater sigmoid cavity, close to this is a second cavity called lesser sigmoid cavity, which receives the upper end of the *radius*, (bone XXXIII.)

2. *Olecranon*. The olecranon, is a large bump, which forms the extreme point of the elbow. It is a large strong process, answering two purposes; first, as

a long lever for the muscles which extend, or make straight the fore arm; and second, when the arm is extended, as in pulling, it checks into its place, and takes such a strong hold upon the hinge or joint from luxation forwards, or from straining any of the ligaments attached to the joint.

3. *Coronoid process.* This process stands up perpendicularly from the upper or fore part of the bone. It forms the fore part of the *sigmoid cavity*, and completes the hinge. The coronoid process is useful, like the olecranon, in giving a fair hold and larger lever to the muscles, and to secure the point; for the arm being extended, as in pulling the olecranon, prevents luxation forwards; the arm again being bent, as in striking, the coronoid process prevents luxation backwards, so the joint consists of the olecranon and coronoid processes, as two guards, and of the sigmoid cavity or hollow of articulation between them.

4. *Tubercle.* On the root of the coronoid process, there is a rough tubercle for the attachment of the *brachialis internus*, (mus. 133.)

5. *Lower head.* The *ulna* grows gradually smaller as it descends towards the wrist, and terminates almost in a point, which is named the *lower head* of the *ulna*. This head is received into a hollow on the side of the radius.

6. *Styloid process:* Below the *lower head* of the *ulna*, it ends towards the little finger, in a small rounded point, which is named the styloid process of the *ulna*.

XXXIV. RADIUS. The second bone of the fore arm, which has gotten its name from its supposed resemblance to the spoke of a wheel. Like the *ulna*, it is of a triangular figure, but it differs from that bone in growing larger as it descends, so that its smaller part

answers to the larger part of the *ulna* and *vice versa*. The radius is the bone to which the wrist is attached; it lies along the outer edge of the fore arm, next to the thumb; and being, like the *ulna*, of a triangular form, it has one of its angles or edges turned toward the *ulna* to receive the *interosseous ligament*. The parts of this bone, are,

1. *Upper head*. It is of a round, flattish, and button-like shape, and so lies upon the lower end of the *humerus*, and upon the coronoid process of the *ulna*, that it is articulated with both bones.

2. *Neck*. Immediately below the head, is a narrowness, or straitening, called the neck of the radius; round this neck there is a collar or circular ligament, named the coronary ligament which keeps the bone securely in its place, turning in this ligamentous bond like a spindle in its bush or socket; for the radius has two motions, first accompanying the *ulna* in its movements of flexion and extension; and secondly, its own peculiar rotation, in which it moves and turns the wrist.

3. *Tubercle*. Immediately under this neck, and just below the collar of this bone, there is a prominent bump, like a flattened button, fastened upon the side of the bone, which is the point into which Muscle 132 is inserted.

4. *Lower head*. The lower head of this bone swells out, broad and flat, to receive the bones of the wrist. The two largest bones of the wrist, the *scaphoides* and *lunare*, which form a large ball, are received into the lower head of the radius: the impression which these two bones make is pretty deep, and somewhat of a boat-like shape; whence it is called the *scaphoid cavity* of the radius.

5. *Scaphoid cavity*. This cavity of the *radius* forms

the joint with the wrist; but there is another small cavity on the side of the radius, into which, the lesser head of the ulna is received, and this is enclosed in a proper and distinct capsule.

XXXV. **CARPUS**, or wrist. The wrist is composed of eight small bones disposed in two rows; one of which rows is attached to the bones of the fore arm, and the other to the bones of the hand. These bones are named from their figure. In describing them, I shall mention them as beginning with the row next to the arm, and with the external bone of each row.

The bones composing the first row, are,

1. *Os scaphoides*; the boat-like bone. It is one of the largest bones of the wrist, and is worthy of notice, not because it is the largest, but because it forms the chief part of the joint of the wrist: it is this bone which is received into the scaphoid cavity of the radius.

The points of this bone to be remembered, are,

A. The round surface, covered with cartilage, smooth, answering to the cavity in the head of the radius.

B. The hook-like, or projecting process, which forms one of the corner points of the wrist, and gives hold to one corner of the ligament which binds down the tendons of the wrist.

C. There is also a furrow for the capsular ligament, the cavity from which this bone takes its name, and by which it is articulated with the trapezium and trapezoides.

D. On its inner surface, there is a cavity for the *os magnum*.

2. *Os lunare*. So named from one of its sides being somewhat of the shape of a half moon. This bone takes an equal share in the point with the scaphoid bone. The chief marks of this bone, are,

A. The surface of a semilunar shape, on the radial side.

B. The convex surface for articulation with the *radius*.

C. The ulnar surface for articulation with the *os cuneiforme*.

D. The hollow surface for articulation with the *os magnum*. The central bone of the second row.

3. *Os cuneiforme*, or wedge-like bone. The side of this bone forming the upper part of the wrist is broader than the point towards the palm of the hand, from which circumstance it has taken its name: but it is chiefly so called from its situation, it being closely wedged in between the lunare and pisiform bones,

4. *Os pisiform*. This is a small, neat, and round bone, named sometimes *orbiculare*, or round bone. but oftner *pisiform*, from its resemblance to a pea. It is placed upon the cuneiform bones standing off from the wrist into the palm of the hand, so as to be the most prominent of all the corner bones. This bone is the point into which the ligament of the wrist is implanted; the muscle 142 one of the strong muscles for bending the wrist, is inserted into it.

Bones composing the second row.

5. *Trapezium*. This bone has four unequal sides and angles in its back part, from which it has got its name. The parts to be noticed of this bone, are.

A. The great socket, or rather the *trochlea*, for the thumb, and as the thumb stands off from one side of the hand this socket is rather on one side.

C. There is also a little process which makes one of the corner points, and stands opposite to the hook of the cuneiforme.

6. *Trapezoides*. This bone is so named from the

irregular quadrangular figure of its back part. This bone has five articulating surfaces.

7. *Os magnum*; so named from its great size when compared with others. It is placed in the center of the upper row; has a long round head, which is jointed with the socket formed with the *os lunare* and *scaphoides*; on the radial surface, the magnum is articulated with the *trapezoides*; on the ulnar surface with the unciform bone; on the further surface it has three planes, and receives the whole head of the *metacarpal* bone of the middle finger, and part of the metacarpal bone of the fore finger and of the ring finger.

8. *Os unciforme*, or hook-like bone, is named from a hook-like process, which projects towards the palm of the hand. It is a large squared bone, possessing a process of long, flat, firm bone called unciforme, or hook-like, which projects into the palm of the hand, giving a firm origin to the great ligament by which the tendons of the wrist are bound down.

All these bones of the *carpus*, or wrist when they are joined to each other, are covered with a smooth articulating cartilage, are bound to each other by all forms of cross ligaments, and are consolidated, as it were, into one joint.

XXXVI. METACARPUS, or bones of the hand, situated between the wrist and fingers. The metacarpus is composed of four bones, upon which the fingers are articulated. Each of these bones are long and round, with their ends larger than their bodies. The upper end which is termed its base, is flat and oblong, inclining somewhat to the wedge-like form, without any considerable head, or cavity, however it is somewhat hollowed, for the articulation with the carpus or wrist.

The lower ends are raised into large oblong smooth heads, the greatest extent of which, is forwards from the axis of the bone. At the fore part of each side of the root of each of these heads, one or two tubercles stand out, for fixing the ligaments that go from one metacarpal bone to another, to preserve them from being drawn asunder. Around the heads a rough ring may be seen, for the attachment of the capsular ligaments of the first joints of the fingers.

XXXVII. The THUMB and four fingers are each composed of three bones, the regular arrangement of which has obtained for them the name of the three *phalanges*.



BONES OF THE LOWER EXTREMITIES.

XXXVIII. Os FEMORIS, or thigh bone. The thigh bone is a very large, strong bone. It is nearly cylindrical in the middle, and slightly curved. The upper extremity is a spherical head, connected to the body of the bone by a neck; the lower extremity is much larger than the body, and is formed into two condyles.

The parts of this bone, are,

1. *Head*. The head of the thigh bone is the most perfect of any in the human body, its circumference is a very regular circle, of which the head contains nearly two thirds; this head is completely received into its socket, which is not only deep in itself, and very secure, but it is further deepened by the cartilage which borders it, so that it is naturally the strongest joint in all the body; but among other securities there is a round ligament which is attached to a pit in the center

of this head, and fastened to the middle of the socket.

2. *Neck.* The neck of the thigh bone is more than an inch in length, and is thick and strong, which it should be from the great weight which it sometimes has to bear. It is long, that it may allow the head to be set deep in the socket, and standing up from the shoulder of the bone, to keep its motions wide, free and unembarrassed by the pelvis; for without this great length of the neck, its motions would have been checked by the edges of its own socket.

3. *Trochanter major.* This process is situated at the upper end of the thigh bone, and may be easily felt outwardly, being that great lump which we feel in laying the hand upon the haunch. This bump represents the direct end of the thigh bone, while the neck stands off from it at one side. On the upper and fore part of this process, are two surfaces for the insertion of muscles 171 172.

4. *Trochanter minor*, or lesser trochanter. This is smaller and more pointed, rising on the inner side of the bone, situated under the root of the neck. This eminence is also for the attachment of muscles.

5. *Inter-trochantal line.* Between the greater and lesser trochanters there runs a rough line, which is thus named. The capsular ligament is attached to this line, and also muscle 175.

6. *Linea aspera.* The linea aspera is a rising or prominent line, very rugged and unequal, which runs all down the back part of the thigh. It begins at the roots of the two trochanters, and ends in the tubercles at the lower end of the bone.

7. *Condyles.* The condyles are the two tubers, into which the thigh bone swells out at its lower part.

There is a gentle and gradual swelling of the bone, then an enlargement into two broad and flat surfaces, which are united with the next bone in forming the joint of the knee.

XXXIX. TIBIA, so named from its resemblance to a pipe: the upper part of the tibia, representing the expanded or trumpet-like end, the lower part representing the flute end of a pipe. The tibia, on its upper end, is flat and broad, making a most singular articulation with the thigh bone; for it is not a ball and socket, like the shoulder or hip joint, nor a hinge joint, guarded on either side with projecting points, like the ancle. There is no security for the knee joint, by the form of its bones, for they have plain flat heads, nicely laid upon each other. It is only by the number of its ligaments, that the knee joint is strong.

The parts of this bone, are,

1. *Upper head.* The upper head of the tibia is thick and spongy, in which there are two broad and superficial hollows, as if impressed, when soft, with the marks of the condyles of the thigh bone. A high ridge rises between these two hollows so as to be received into the *interstice*, or space between the condyles, on the back part, which is the highest point of the ridge.

2. *Tubercle.* This is situated on the fore part of the tibia, just below the knee.

3. *Lower head.* The lower head of the tibia composes the chief parts of the ancle joint. The lower head of the tibia is smaller than the upper, in the same proportion that the ancle is smaller than the knee. The pointed part of this head of the tibia represents the mouth piece or flat part of the pipe, and constitutes the bump of the inner ancle. On one side of the low,

er end of the tibia, there is a deep hollow, like an impression made with the point of the thumb, which receives the lower end of the *fibula*.

XL. FIBULA; so named from its resemblance to a Roman clasp. This is a small bone placed on the outside of the leg, opposite to the external angle of the tibia, the shape of it is irregular.

This bone has no connection with the knee joint, but is useful in strengthening the leg, and in forming the ankle joint.

The parts of this bone, are,

1. *Upper head*. The upper head of the fibula is rough on the outer surface, for the insertion of a ligament, and muscle 184; smooth, and with cartilage within; and is laid upon a plain smooth surface, on the side of the tibia a little below the knee joint, and is there closely confined by ligaments.

2. *Lower head*. The lower head of the fibula is broad and flat, and is let pretty deep into a socket on the side of the tibia; together, they form the ankle-joint for receiving the bones of the foot. The extreme point of the thin extremity, gives attachment to the outer ligament of the joint, and is sometimes called the *coronoid process*.

XLI. PATELLA, or knee-bone. The kneecap, or cap, as it is sometimes called, is a small thick bone, of an oval, or rather of a triangular form. The basis of this rounded triangle is turned upwards to receive the four great muscles which extend the legs, the apex or pointed part of this triangle is turned downwards, and is tied by a very strong ligament to the bump or tubercle of the tibia, just under the knee. The outer surface is rough, the inner smooth, and divided by a ridge into two unequal parts; round the margin of the

bone, there is a slight depression for the attachment of the capsular ligament, by which, it is closely connected to the tibia.

The patela is useful as a lever, acting as a pully, which is a species of lever, gliding upon the fore part of the thigh bone, upon the smooth surface which is between the condyles.

XLII. TARSUS, or instep. The instep consists of seven bones; viz:

The *astragalus*, *os calcis naviculare*, *cuboides*, *cuneiforme externum*, *cuneiforme medium*, and *cuneiform internum*.

The *astragalus* is the uppermost of these bones. The *os calcis* is below the *astragalus*, and forms the head. The *os naviculare* is in the middle of the internal side of the instep. The *os cuboides* is the most external of the row of four bones, at its fore part. The *cuneiforme externum* is placed at the inside of the *os cuboides*. The *cuneiforme* bones; and the external *cuneiforme* is at the internal side of the foot.

1. *Astragalus*. This is the largest and most remarkable bone of the *tarsus* or instep. The semicircular head of this bone forms a curious and perfect pully, which is covered with a smooth lubricated cartilage, and received deep between the *tibia* and *fibula*, and rolls under the smooth articulating surface of the latter, which, being suited to this pully of the *astragalus*, with something of a boot like shape, which is often named the scaphoid cavity. The different points of this bone, are:

A. Superior surface agreeing with the scaphoid cavities of the *tibia*.

C. Internal articulating surface for the maleus internus, or internal ancle.

D. External articulating surface, for the extremity of the fibula.

E. Inferior and posterior articulating surface with the body of the os calcis.

F. Inferior and anterior surface, articulating also with a corresponding surface of the os calcis.

G. Deep *fossa*, or depression, dividing these two inferior articulating surfaces, for the lodgment of the ligament, which unites this bone to the os calcis.

H. The ball or anterior articulating surface which enters into the socket of the naviculare.

I. A furrow for the attachment of the capsular ligament.

J. On the inside of the bone is a hollow and a rough protuberance for the attachment of the *delloid* ligament, which comes down from the tibia.

2. *Os calcis*. This is a large irregular bone; it is the tip or end of the arch, formed by the *tarsal* and *metatarsal* bones, and is situated posteriorly, or behind, forming the heel.

The processes of this bone, are,

A. Great process. This is an irregular surface, on the highest part of the projection backwards, to which a tendon is fastened.

B. The lower and back part of the bone is rough, for the attachment of the cartilagenous and cellular substance in which it rests.

C. An irregular articulating surface, or rather two surfaces covered with cartilage, by which this bone is joined with the os cuboides.

D. A groove situated on the outside of this bone, which transmits the tendon of muscle 191.

E. *Tubercle*. This is situated internally, and gives attachment to a ligament, which supports the lower part of the ball of the astragalus.

3. *Os naviculare*, sometimes called *os scaphoides*. from its partial resemblance to a boat; it is articulated as follows:

A. The concave side which looks backwards is deep, and receives the head of the astragalus.

B. The flat side which looks forward has not so deep a socket, but receives the three cuneiform bones, upon a surface rather plain and irregular.

C. At the inner and lower part of this bone there is a tubercle, for the attachment of a ligament.

4. *Os cuboides*. The *os cuboides* is named from its cubical figure, and is next to the astragalus in size. This bone is situated between the third cuneiform bone and the *os calcis*. It forms a complete arch, within an arch, which gives at once a degree of elasticity and of strength to the instep. The fore point of this bone is divided into two surfaces, for the metatarsal bones. At the lower surface of this bone there is a groove for transmitting the tendon of muscle 191. This bone is laid on the *cuneiforme medium*, and joins it to the *os calcis*.

5. *Cuneiform bones*, are so named because they resemble wedges. being laid to each other like the stones of an arch. The most simple arrangement is 1, 2, & 3; counting from the side of the great toe, towards the middle of the foot.

A. The first, is called *cuneiform magnum*, or *externum*, on this bone the great toe is placed or takes its origin; it has its sharp edge turned upwards; it is much larger than the other.

B. The second, *cuneiform minimum* or *internum*. This bone is situated between the other two; and is the smallest.

C. The third, is called *cuneiform medium*. This

bone is so named because it is a medium size between the greatest and smallest. These cuneiform bones receive the great toe, and the two next to it. The fourth and fifth toes are implanted upon the *os cuboides*.

XLIII. METATARSUS. So named from its being placed upon the tarsus; it consists of five bones, which extend between the tarsus and the proper bones of the toes.

1. The metatarsal bone of the great toe is the shortest, thickest, and strongest. It has the greatest weight to sustain.

2. The *metatarsal* bone of the second toe is the largest of the five, and is supported by the *os cuneiform medium*.

3. The metatarsal bone of third toe, is the second in length, and is supported by the *os cuneiform medium*.

4. The metatarsal bone of the fourth toe is nearly as long as that of the third, and is articulated to the *os cuboides*.

5. The metatarsal bone of the little toe is much shorter than that of the fourth. This bone is partly articulated to the *os cuboides*.

When standing the fore ends of the metatarsal bones, and the *os calcaneus*, are our only supporters, it is therefore necessary that they should be very strong.

XLIV. TOES. The last division of the foot, consisting of three bones in each toe excepting the great toe which has but two; these bones are disposed in rows, and are named the first, second, and third *phalanges*, or ranks of the toes. It would be a waste of time and expense for nothing to give a minute description of these small bones.

XLV. SESSAMOID BONES, so named from their

resemblance to the seeds of the sesamum. They are small bones, about the size of half a pea. They are most commonly found at the second joint of the thumb, and of the great toe; and are placed in pairs, especially at the great toe, between the tendons of the flexor muscles and the bones. In the joints of the thumb and toe, they appear to be very analagous to the patella or knee pan.

The following is a table of all the bones in the human system.

A TABLE OF BONES.

BONES OF THE CRANIUM OR SKULL.	{	Frontal,	1
		Parietal,	2
		Occipital,	1
		Temporal,	2
		Ethmoid,	1
		Sphenoid,	1
BONES OF THE FACE.	{	Superior Maxil.	2
		Jugale,	2
		Nasal,	2
		Lachrymal,	2
		Palatine,	2
		Inferior sponga,	2
		Vomer,	1
		Inferior Maxil.	1
DENTIS OR TEETH.	{	Incisors,	8
		Cuspidati,	4
		Molares,	20
BONE OF THE TONGUE,	{	Hyoides,	1
Maleus,		2	
BONES OF THE EAR.	{	Incus,	2
		Stapes,	2
		Orbiculare,	2
BONES OF THE TRUNK.	{	Vertebrae,	24
		Sacrum,	1
		Coccyges,	1
		Sternum,	1
		Innominata ossa,	2
BONES OF THE UPPER EXTREMITIES.	{	Clavicle,	2
		Scapula,	2
		Humeri os,	2
		Ulna,	2
		Radius,	2
		Carpus,	16
		Metacarpus,	10
BONES OF THE LOWER EXTREMITIES.	{	Phalanges,	28
		Femur,	2
		Patella,	2
		Tibia,	2
		Fibula,	2
		Tarsus,	14
		Metatarsus,	10
		Phalanges,	28
Sesamoid bones of the thumb and great toe,			8
TOTAL.			248

EXPLANATION OF PLATE 2.

A Front View of the Male Skeleton.

- | | | | |
|----------|--|-----------------|---------------------------------------|
| A | The os frontis. | q | The middle piece. |
| B | The os parietala. | r | The cartilage ensiformis. |
| C | The coronal suture. | s | The clavicle. |
| D | The squamous part of the temporal bone. | t | Internal surface of the scapula. |
| E | The squamous suture. | u | Its acromion. |
| F | The Zygoma. | v | Its caracoid process. |
| G | The mastoid process. | w | Its neck or cervix. |
| H | The temporal process of the sphenoid bone. | x | Its glenoid cavity. |
| I | The orbit. | y | The os humeri. |
| K | The os malæ. | z | Its head. |
| L | The upper Jaw bones. | 1 | Its tubercle. |
| M | Its nasal process. | 2 | Its internal tubercle. |
| N | The ossa nasi. | 3 | Its groove. |
| O | The os unguis. | 4 | Its condyle, |
| P | The lower jaw. | 5 | Between 4 & 5 its trochlea. |
| Q | The teeth. | 6 | The radius. |
| R | The sever cervical vertebræ. | 7 | Its head. |
| S | Their transverse processes. | 8 | Its tubercle. |
| T | The 12 dorsal vertebræ. | 9 | The ulna. |
| U | The five lunar vertebræ. | 10 | Its coronid process. |
| V | Their transverse processes. | 11 to 18 | The carpus composed of several bones. |
| W | The upper part of the os sacrum. | 19 | The five bones of the metacarpus. |
| X | Its side parts. | 20 | The two bones of the thumb. |
| Y | The os ilium. | 21 | The three bones of each finger. |
| Z | Its crest or spine. | 22 | The os femoris. |
| a | The anterior spinous process. | 23 | Its head. |
| b | The brim of the pelvis. | 24 | Its cervix or neck, |
| c | The ischeatic notch. | 25 | The trochanter major. |
| d | The os ischeum. | 26 | The trochanter minor. |
| e | Its tuberosity. | 27 | The internal condyle. |
| f | Its spinous process. | 28 | The external condyle. |
| g | Its crus, or root. | 29 | The rotula or knee pan. |
| h | The foramen thyroideum. | 30 | The tibia. |
| i | The os pubis. | 31 | Its head. |
| k | The symphysis pubis. | 32 | Its tubercle. |
| l | The crus pubis or origen. | 33 | Its spine. |
| m | The acetabulum. | 34 | The internal ancle. |
| n | The seventh or last true rib. | 35 | The fibula. |
| o | The twelfth or last false rib. | 36 | Its head. |
| p | The upper end of the sternum. | 37 | The external ancle. |
| | | 38 | The astragalus |





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|----|-----------------------------------|----|------------------------------------|
| 39 | The os calcis. | 43 | The two bones of the great toe. |
| 40 | The os naviculare. | 44 | The three bones of each small toe. |
| 41 | The three ossa cuneiforme | | |
| 42 | The five bones of the metatarsus. | | |



EXPLANATION OF PLATE 3.

Front View.

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|----|---|----|--------------------------------|
| AA | The ossa parietala. | f | Seventh or last true rib. |
| B | The sagittal suture. | g | Twelfth or last false rib. |
| C | The lambdoid suture. | h | The clavicle. |
| F | The mastoid process of the temp. bone. | i | The scapula. |
| G | The os malæ. | k | Its spine. |
| H | The palatine plates of the upper jaw bones. | l | Its acromion. |
| I | The lower jaw. | m | Its cervix or neck. |
| K | The teeth of both jaws. | n | Its superior costa or rib. |
| L | The 7 cervical vertebræ. | o | Its posterior costa. |
| M | Their spinous processes. | p | Its inferior costa. |
| N | Their transverse and oblique processes. | q | The os humeri. |
| O | The last of the 12 dorsal vertebræ. | r | Radius. |
| Q | The transverse processes | s | Ulna. |
| R | The oblique processes. | t | Its olecranon. |
| S | The spinous processes. | u | Bones of the carpus. |
| T | The upper part of the os sacrum. | v | 5 bones of the metacarpus |
| U | The posterior holes for nerves, &c. | w | 2 bones of the thumb. |
| V | The under part of the os sacrum. | x | 3 bones of each finger. |
| W | The os coccygis. | y | 2 sesamoid bones of the thumb. |
| X | Os ilium. | z | Os femoris. |
| Y | Its spine or crest. | 1 | Trochanter major. |
| Z | Ischiatic notch. | 2 | Trochanter minor. |
| a | Os Ischium. | 3 | Linea aspera. |
| b | Its tuberosity. | 4 | Internal condyle. |
| c | Its spine. | 5 | External condyle. |
| d | Os pubis. | 6 | Semilunar cartilages. |
| e | Foramen thyroideum. | 7 | The tibia. |
| | | 8 | Internal ancle. |
| | | 9 | Fibula. |
| | | 10 | External ancle. |
| | | 11 | The tarsus. |
| | | 12 | The metatarsus. |
| | | 13 | The toes. |



PART SECOND.

OF ARTICULATIONS, LIGAMENTS, BURSAE, MUCOSÆ, &c.

The skeleton is composed of a great number of bones, which are all so admirably constructed, and with so much affinity to each other, that the extremities of each bone is perfectly adjusted to the end of the bone with which it is connected. This connection is termed their articulation, of which, anatomists distinguish four kinds: the first is named *diarthrosis*; the second *synarthrosis*; the third *ssymphysis*, and the fourth, *amphiarthrosis*.

I. DIARTHROSIS. A free, moveable connection of bones. This genus has four species, viz:

1. *Enthrosis*. A ball and socket joint, in which the round head of one bone is received into a cavity of another, so as to admit of motion in every direction; as the hip joint.

2. *Antherodia*. A moveable connection of bones, in which the head of one bone is received into the superficial cavity of another, so as to admit of motion in every direction, as the head of the *os humeri*, or upper bone of the arm, with the glenoid cavity of the *scapula*, or shoulder blade.

3. *Ginglymus*. A hinge joint, which admits of flexion and extension, as the knee and elbow joint.

4. *Trochoides*. A moveable connection of bones, in which one bone rotates or turns upon another; as the first vertebra of the neck upon the *odontoid*, or tooth-like process of the second.

II. SYNARTHROSIS. An immoveable connection of bones, in which they are united together by an

immoveable union It has three species, viz:

1. *Suture*; To join together. The word suture is applied to bones where they are joined together by a dentiform or tooth like margin; as in the bones of the head.

2. *Harmonia*; To fit together. An immoveable connection of bones, in which bones are connected together by means of rough margins, not dentiform; in this manner most of the bones of the face are connected together.

3. *Gomphosis*; To drive in a nail. A species of connection of bones, in which one bone is fixed in another, like a nail in wood, or as the teeth in the alveoli of the jaws.

III. *SYMPHYSIS*; To grow together. A connection of bones, in which they are united by means of an intervening body. It comprehends three species, viz:

1. *Synchondrosis*. A connection of bones, in which one bone is united with another by means of an intervening cartilage; as the vertebræ, and the bones of the pubes.

2. *Synsurosis*. A connection of bones, in which one bone is united to another by means of an intervening membrane.

3. *Syndesmosis*. A connection of bones, in which one is united to another by a ligament, as the radius with the ulna.

IV. *AMPHIARTHROSIS*. A connection of bones partaking both of *diarthrosis* and *synarthrosis*, which admits only of an obscure motion, as in the wrist and ankle.

The surfaces of bones which form the moveable articulations are covered with cartilaginous matter, and

are retained in their relative situations by ligaments, which are exterior to the cavities of the articulations, and placed in such situations that they permit the motions of which the joints are calculated to perform, while they keep the respective bones in their proper places. They are invested in a particular manner by a thin delicate membrane, which in some joints as those of the hip and shoulder seems to be the internal lamina, or layer of a stronger ligament called the capsular ligament: and in all other joints, the knee for example, appears to be independent of any other structure. In such cases, the *capsular ligament*, or *synovial membrane* as it is sometimes called, forms a complete sack or bag, which covers the articulating surface of one bone, and is reflected from it to the corresponding surface of the other; adhering firmly to each of the articulating surfaces, and extending loosely from the margin of one surface to that of the other.

The *synovial membrane*, or capsular ligament supplies the place of *perichordrium*, (a membrane that covers a cartilage) to the cartilages of the joint, and of periosteum to those surfaces of bones with which it is connected. This membrane secretes, or effuses from its surface, a liquor called *synovia* or joint water; which is particularly calculated to lubricate parts that move upon each other.

There are in many of the joints masses of fat. which appears to project into the cavity, but are exterior to the *synovial membrane*, and covered by it; as the *viscera* in the abdomen are covered by the *peritoneum*, or membrane. These masses of fat are generally situated so as to be pressed gently, but not bruised by the motions of the bones.

These masses have been considered as *synovial*

glands; but they do not appear like glands; and it is probable that the synovia is secreted by the whole internal surface of the membrane.

The synovial membrane, like the other parts of the joint, is insensible, or at least sensibility is very weak in a sound state, but extremely painful when inflamed.

The membranes, cartilages, and ligaments of the joints, are slow in entering into action, but once excited, they continue to act with a perseverance quite unknown in any other part of the system. The diseases to which the joints are subject, are numerous.—They are subject to dropsical effusions; they are subject to gelatinous concretions; they are subject to slight inflammations, to suppuration or pus, to *corosions* or eating away the cartilages, suppurations and mortifications of the more softer parts. Rheumatism is an inflammation round the joints, with a slight effusion, which is soon absorbed. Chronic rheumatism is a tedious and slow inflammation, with gelatinous effusions round the tendons, and swelling, and lameness round the joints. Gout, in the joint, is a high state of inflammation with a secretion of earthy matter into its cavity. There are many other diseases to which the joints are subject, as whitlow, white swellings, &c.



OF PARTICULAR ARTICULATIONS.

THE CONNECTION OF THE HEAD WITH THE VERTEBRÆ.

The condyles of the occipital bone, and the corresponding cavities of the atlas, or upper vertebra, are covered with cartilage. The condyle and cavity on each side are covered with a capsular or synovial lig-

ament; at this joint the nodding motions of the head is performed.

The atlas so rests upon the second vertebra. or as it is called *vertebra denta*, that all the turning motions are performed at that point, so that it requires two joints for the head to perform its various motions.

These joints are held together by various ligaments, the description of which would be of but little use to the readers of this volume.

Articulations of the vertebræ with each other.

The bodies of all the vertebræ, except the atlas, are connected to each other by the intervertebral cartilaginous matter, which unites them very firmly, allowing at the same time some motion, in consequence of its elasticity and compressibility. This connection is strengthened by two ligaments, which extend the whole length of the spine, from the second vertebra of the neck to the os sacrum, together with various other ligaments.

Articulation of the Lower Jaw.

The glenoid cavity of the temporal bone, with the tubercle before it, and the condyle of the lower jaw, are covered with cartilages. And to render the motions of this joint easy and free, a moveable cartilage is placed between them, which being flexible, is accommodated to the convexity of the condyle and hollowness of the glenoid cavity, and also to the figure of the tubercle to which it is extended.

This joint is completed by a capsular ligament of the common form, which arises from the neck of the condyle, and which is so fixed into the temporal bone

as to include both the proper socket and the root of the zygomatic process.

The strength of this joint not only depends upon its ligaments, but upon muscles 35, 37, & 8, which are inserted close round the joint.

THE LIGAMENTS OF THE LOWER JAW, ARE,

- 1 Capsular ligament.
- 2 Ligamentum cartilaginis intermediæ.
- 3 " maxillæ lateral externum.
- 4 " " lateral internum.
- 5 " inter maxillum.
- 6 " processum styloideum.

The lower jaw is subject to dislocation, by blows, yawning, fits, &c. and is known by an inability to shut the mouth, and the projection of the chin. Before attempting to reduce this joint. the muscles should be relaxed, which may be done by applying flannels wrung out of warm water for fifteen or twenty minutes; if much swelled, it will require a longer time. After the muscles have become relaxed, seat the patient in a chair, and let his head be supported against the breast of an assistant. You may then push your thumbs between the teeth and cheeks until they reach the upright portion of the bone, while with the fingers outside, you grasp the bone, which is to be pressed downwards and backwards, while at the same time the chin is to be raised and pushed backwards; if this process is rightly performed there will be no difficulty in reducing it.

I have succeeded in reducing the jaw, when dislocated, after the muscles were properly relaxed, by introducing the fore finger of each hand and pushing the upright portion of the bone backwards, bearing the chin up at the same time with my thumbs.

Articulation of the Ribs.

The ribs have two joints, and a hinge-like motion, rising and falling alternately, as we draw in or let out our breath. The two joints of the ribs are thus secured; first, the proper head of the ribs being hinged upon the intervertebral substances, and touching two vertebræ, it is tied to the bodies of each by a regular capsule or synovial ligament. The back of the rib touches the fore part of the transverse process, and is articulated there; consequently there is a small capsular ligament belonging to this joint also. These joints are secured by several ligaments.

The ribs are also fixed into the breast bone by their cartilages, each of which has a round head, a distinct socket, a regular capsule, and ligaments which hold them firm to their places. There are six ligaments which bind a rib to the spine, and three at the breast bone.

Articulations of the Clavicle.

The connection of the clavicle with the breast bone resembles that of the lower jaw—and temporal bone. A moveable cartilage is placed between the articulating surfaces. This cartilage is thin and of a mucous nature, and is moveable in some degree, yet it is fixed by one edge to the head of the clavicle.

This joint is closed in a strong capsular ligament, consisting first of a bag, and then of the outer order of fibres, which go out in a radiated form, upon the surface of the breast bone. The clavicle is also tied to the first rib by a broad ligament called *rhomboid ligament*.

This bone is subject to dislocation and fracture. To

reduce it, seat the patient in a chair, and place a compress of linen under his arm. His arm being bent at right angle at the elbow, is now to be brought down to his side, and secured in that position by a long bandage, which is to be passed over the arm of the affected side and round the body. The fore arm is to be supported by a sling. It takes this bone from four to five weeks to unite.

Articulations of the Os Humeri and Scapula.

The spherical portion of the upper extremity of the upper bone of the arm, is the first which is received in the glenoid cavity of the shoulder blade, both of which are covered with cartilage.

The glenoid cavity of the shoulder blade being of itself small, when compared with the head of the shoulder bone is greatly enlarged with the cartilage that lines the cavity, together with the tendons of muscles which are there inserted, and the capsular ligament which covers this joint. This joint is held in its proper situation by the capsular ligament, which is blended with an external stronger ligament, together with the muscles and their tendons, which are situated about this joint. The ligaments of this joint are eight.

Dislocations of the shoulder are the most common of all accidents of the kind. It is very easily known by the deformity of the joint, and the head of the bone being found in some unnatural position. To reduce it, seat the patient on a chair, place one hand on the prominent part of the shoulder blade, just above the spot where the head of the bone should be, while with the other you grasp the arm above the elbow and pull it outwards.

A better plan is to let one extend the arm, and another place the head of the bone, this will be easier done, after the muscles have been relaxed with warm water.

Articulation of the Elbow.

The elbow-joint is formed by three bones; the *humerus*, *radius*, and *ulna*; the surfaces of these bones, where they move upon each other, are covered with cartilage. The motion of the ulna and radius on the *os humeri* is that of flexion and extension. The head of the radius performs a part of a revolution, nearly on its own axis, without moving from the depression in the side of the ulna, with which it is in contact.

The *synovial* or capsular ligament adheres very firmly to the surface, covered with cartilage on each of the bones, and is reflected from the margin of the surface of one bone, to that of the others. As the principal motion performed in this joint is hinge-like, so, the principal ligaments are on the sides.

The ligaments of this joint are five.

This joint is sometimes dislocated backwards. When this is the case, seat the patient on a chair, let one person grasp the arm near the shoulder, and another the wrist, and forcibly extend it, while you interlock the fingers of both hands just above the elbow, and pull it backwards, remembering that whatever degree of force is required, should be applied in this direction.

When this joint is dislocated laterally or side ways; to reduce it, let one pull at the wrist, while another secures the arm above, then push the bone into its place, either inwards or outwards, as may be required.

Articulation of the Wrist.

The structure of the wrist is very complex. It consists of three articulations, which are contiguous to each other, viz:

1. That of the *ulna* and *radius*.
2. That of the *radius* and first row of the bones of the wrist.
3. That of the first and second row of the bones of the wrist with each other.

A long convex head is formed by the upper surface of the *scaphoides* and *lunare*, and a portion of the upper surface of the *cuneiform* bone. This head is covered with a cartilage, which is so uniform that the different bones cannot be distinguished from each other. The lower end of the *radius* is articulated with this head, but does not cover the whole of it; a portion of this head is therefore under the *ulna*, but not in contact with that bone. The lower end of the *ulna* is in contact with the upper surface of the above named cartilage, but is articulated to the side of the *radius*.

A synovial membrane covers the articulating head formed by the three bones of the wrist, and is reflected from the margin of their cartilaginous surface, to the cartilage at the end of the *radius*. A fold of this membrane passes from the head of the wrist, at the junction of the *scaphoides* and *lunare*, to the opposite part of the cartilage of the *radius*, and has been called the *mucons ligament*.

The surfaces, by which the first and second rows of the bones of the wrist are articulated with each other, are very irregular, and being so closely connected with each other, that the name of joint can hardly be applied to them. They are rather fixed than jointed to each other. The first row is united to the second, by

a general and distinct capsule, in addition to which each single bone is tied to the next adjoining bone by a regular capsular ligament within, and by flat cross ligaments without, or rather by many bundles of ligaments, which cross each other in a very complicated manner. The ligaments of the wrist are nine in number.

Articulation of the Carpal and Metacarpal bones.

The metacarpal bones, or bones between the wrist and fingers, are connected to the last row of the wrist by surfaces which are covered with cartilages, and supplied with synovial or capsular ligaments, as the most of moveable articulations are; but the ligaments which connect these bones do not permit much motion between them. The irregularity of the articulating surfaces of the metacarpal bones of the fore and middle finger, also contribute to restrain their motion; accordingly these two bones move less than the other two bones of the hand, the surfaces of which are better adapted for motion.

Articulation of the Fingers.

The first joint of the fingers have a large synovial or capsular ligament, which covers the head of the metacarpal bone, and corresponding cavities of the first bones of the fingers. The other joints of the fingers are articulated in a similar manner, all of which are secured in their proper places by ligaments passing from one bone to another.

Dislocation of the wrist, fingers, and thumb, are to be reduced by forcibly extending the lower extremity of the part, and pushing the bones into their prop-

er place. These accidents should be attended to without delay, for if neglected, they shortly become irreducible.

The Hip Joint.

The *acetabulum*, or cavity for receiving the head of the thigh bone, is lined with cartilage, the brim of which is much enlarged, and the cavity deepened, by the addition of fibrous cartilaginous matter, which forms a regular smooth edge. The head of the thigh bone is also covered with a smooth cartilage, having a depression in the center. From this depression a strong ligament arises, which appears to pass to a depression in the center of the cavity, but terminates in the lower edge of the cartilaginous ring or margin. This ligament allows the head of the thigh bone to rise out of the cavity, but is probably torn in every luxation of the hip joint.

The *capsular ligament*, which contains these articulating parts, is the strongest one in the body. It arises near the basis of the cartilaginous brim, but it does not adhere to the cartilaginous edge; and is inserted into the thigh bone, near the roots of the *trochanters*, so that it includes a large portion of the neck of the bone. There are five ligaments united in securing the hip joint, but the greatest dependence is upon the capsular ligament.

Notwithstanding the hip joint is the strongest one in the body, it is sometimes dislocated. When this accident happens, place the patient on his back upon a table. Take two sheets, and fold them like a cravat, which are to be passed between the thigh and testicle, on each side, one half of each sheet passing obliquely over the belly to the opposite shoulder, while the other

half passes under the back in the same direction, the ends of which are to be fastened to something that is firm, or held by assistants. The thigh is then to be steadily and forcibly extended, while you will be turning and twisting the limb to assist in dislodging it from its unnatural situation. The reduction of this joint should never be attempted until the parts are well relaxed, by the application of cloths wrung out of warm water.

Articulation of the Knee.

The knee joint is composed of the thigh bone, *tibia*, and *patella*, or knee pan, and are united by many ligaments, both within and without the joint.

This joint as it relates to the bones is very weak. There is in this joint no fair cavity, for receiving the head of a bone as in the hip, no slighter ball and socket as in the fingers; no strong overhanging bones, as in the shoulder, nor hook-like processes as in the *ulna*. The strength of this joint does not depend upon its bones, but upon the number, size, and disposition of the great ligaments with which its bones are joined; by virtue of these ligaments it is one of the strongest joints of the human body. The articulation of this joint has been described in the description of the bones of the thigh, leg, &c. (which see.) The ligaments of the knee are fifteen.

This joint is sometimes dislocated, but requires very little force to reduce it. Sometimes the patella or knee pan is dislocated, which will be easily known by its unnatural situation. To reduce it, bring the leg in a right angle with the body, and with the hand push it to its proper place.

Articulation of the Ankle.

It should be observed that the *tibia* and *fibula* are so firmly connected with each other at the lower end, that they may be considered as forming but one member of this joint. They together form one cavity for receiving the astragalus, with two projecting points, the *fibula* forming the outer angle, and the *tibia* forming the process of the inner angle.

This joint is made strong by the lower heads of the *tibia* and *fibula*, which serve as guards to the foot, so that when the ankle is luxated these bones are often broken. This joint possesses a capsular ligament, together with several other ligaments, which assist in strengthening it. It is not very common for this joint to be dislocated; however, should it happen, let one person hold the leg, and another extend the foot, while you push the bone to its proper place. The joint is then to be covered with compresses wet with vinegar, and a splint applied to each side. Accidents of this kind are very dangerous, and should receive prompt attention.

The other articulations of the foot have been noticed in the description of the bones of the foot (which see.)



OF PARTICULAR LIGAMENTS.

The following are some of the most important ligaments of the human system, and which will frequently be referred to in explaining the muscles,

Ligaments of the Scapula.

1. *Triangular ligament.* This ligament arises broad from the external surface of the coracoid process, and becomes narrower where it is fixed to the posterior margin of the *acromion*. It confines the tendon of muscle 125, and assists in protecting the upper and inner part of the shoulder joint.

2. *Posterior ligament of the scapula.* This ligament is sometimes double, and is stretched across the semilunar notch of the shoulder blade, forming that notch into one or two holes for the passage of the scapular vessels and nerves. It also gives rise to part of muscle 48.

A Ligament of the Fore Arm.

3. *Interosseous ligament.* This ligament is situated between the sharp ridges of the *radius* and *ulna*, filling up the greater part of the space between these two bones, and is composed of small *fasciculi*, or fibrous slips, which run obliquely downwards and inwards. Two or three of these, however, go in the opposite direction; and one of them, termed *oblique ligament* and *chorda transversalis cubiti*, is stretched between the tubercle of the ulna and under part of the tubercle of the radius. This ligament prevents the radius from rolling too much outwards, and furnishes attachment for muscles.

Ligaments retaining the tendons of the muscles of the hand and fingers in their proper position.

4. *Anterior annular ligament of the wrist.* This ligament is stretched across from the projecting points of the *pisiform* and *unciform* bones, to the *os scaphoides*.

and *trapezium*, forming an arch which covers and preserves in their places the tendons of the flexor muscles of the fingers.

5. *Vaginal ligaments of the flexor tendons.* These are fine membranes, connecting the tendons of muscles 151 and 152; forming at the same time *bursæ mucosæ* which surround the tendons.

6. *Vaginal or crucial ligaments of the fingers.* These ligaments arise from the ridges on the concave side of the bones of the fingers, and run over the tendons of the flexor muscles of the fingers. Upon the body of the phalanges, they are thick and strong, to bind down the tendons; but over the joints they are thin, and have, in some parts, a crucial, or transverse intersecting appearance, to allow the ready motion of the joints.

7. *Accessory ligaments of the flexor tendons of the fingers.* These are small tendinous ligaments, arising from the first and second phalanges of the fingers. They run obliquely forwards within the vaginal ligaments, terminating in the tendons of the two flexor muscles of the fingers, and assist in keeping them in their places.

8. *Posterior annular ligament of the wrist.* This is part of the *aponeurosis* or tendinous expansion of the fore arm, extending across the back of the wrist, from the extremity of the ulna and *os pisiforme* to the extremity of the radius. It is connected with the small annular ligaments which tie down the tendons of Muscles 141, 147 & 148.

9. *Transverse ligaments.* These are aponeurotic slips running between the tendons, near the heads of the metacarpal bones, and retaining them in their places.

Ligaments of the fore part of the Thorax.

10. *Membrane proper to the sternum.* This membrane is a firm expansion, composed of tendinous fibres running in different directions, and covering the fore and back surface of the breast bone, being compounded with the *periosteum*.

11. *Ligaments of the Cartilago Ensiformis.* This is part of the membrane last described, divided into two strong slips which run obliquely from the under and fore part of the second bone of the sternum, and from the cartilages of the seventh pair of ribs to be fixed to the cartilago ensiformis. The ligaments covering the sternum serve considerably to strengthen that bone.

Ligaments of the bones of the Pelvis.

12. *Transverse ligaments.* These ligaments arise from the posterior or back of the spine of the os ilium, and run transversely. One of these is fixed to the last vertebra of the loins, and the other to the first; the other is fixed to the transverse process of the os sacrum.

13. *Ilic sacral ligaments.* These arise from the posterior or back spinous process of the os ilium, descending obliquely, and are fixed to the first, & fourth spinous transverse processes of the os sacrum.

These with the two transverse ligaments, assist in binding the bones together, to which they are connected.

14. *Sacro ischiatic ligaments.* These are situated in the under and back part of the pelvis. They arise in common from the transverse processes of the os sacrum, and likewise from the under and side part of

that bone, and from the upper part of the os coccygis. One of these descends obliquely to be fixed to the tuberosity of the os ischium. The other runs transversely to be fixed to the spinous process of the os ischium. These two ligaments assist in binding the bones of the pelvis, in supporting its contents, and in giving origin to part of its muscles.

There are two membranous productions which are connected with these ligaments, which are attached to the os ischium, termed its *superior* and *inferior appendices*.

The superior appendix, which is tendinous, arises from the back part of the spine of the os ilium, and is fixed along the outer edge of the ligament, which it increases in breadth.

The *inferior* or *falciform appendix*, situated within the cavity of the pelvis, the back part of which is connected with the middle of the large external ligament, and the rest of it extends round the curvature of the os ischium. These two productions assist the large external ligament, or the one which is attached to the tubercle of the os ischium, in furnishing a more commodious situation, and insertion of part of the gluteus maximus, and obturator internus muscles. (See mus. 84, & 170.

15. *Longitudinal ligaments of the os coccygis*. These ligaments descend from those upon the *dorsum* of the os sacrum, to be fixed to the back part of the os coccygis. The ligaments of this bone prevent it from being pulled too much forwards by the action of muscle 85; restoring the bone to its natural situation, after the muscle has ceased to act.

16. *Ligamentous cartilage*. This cartilage unites the *ossa pubis* or share bones together, so as to admit of no motion, excepting in the state of pregnancy,

when it is frequently found to be so softened as to yield a little in the time of delivery.

17. *Obturator membrane or ligament of the foramen thyroideum.* This ligament adheres to the margin of the foramen thyroideum, and fills the whole of that opening, excepting the oblique notch at its upper part for the passage of the obturator vessels and nerves. It assists in supporting the contents of the pelvis, and in giving origin to the obturator muscle (mus. 84.)

18. *Interosseous ligament of the leg.* This ligament fills the space between the two bones of the leg, like the interosseous ligament of the fore arm, and is of a similar structure; being formed of oblique fibres, and perforated in various places for the passage of vessels and nerves. This ligament together with other uses serves for the origin of muscles.

Ligaments of the Foot and Toes.

19. *Annular ligament of the tarsus.* This is a thickened part of the *aponeurosis* of the leg, splitting into superior and inferior portions, which bind down the tendons of the extensors of the toes upon the fore part of the ankle.

20. *Vaginal ligaments of the tendons of the peronci muscles.* These ligaments preserve the tendons in their places, and are the bursæ of these tendons.

21. *Lacinated ligaments.* These arise from the inner ankle, and spread in a radiated manner, to be fixed partly in the cellular substance and fat, and partly to the os calcis, at the inner side of the heel. This ligament encloses muscles 139 & 195.

22. *Vaginal ligament of the tendon of the flexor longus policis.* This ligament surrounds the tendon of muscle 196 in the hollow of the os calcis.

23. *Vaginal and crucial ligaments of the tendons of the flexors of the toes.* These ligaments enclose the tendons on the surface of the bones of the toes, and from their *bursæ mucosæ*.

24. *Accessory ligaments of the flexor tendons of the toes.* These ligaments arise, from the bones of the toes, and are included in the sheaths of the tendons in which they terminate.

25. *Transverse ligaments of the extensor tendons.* These ligaments run between the extensor tendons, preserving them in their proper places behind the roots of the toes.



OF BURSÆ MUCOSÆ.

The *bursæ mucosæ*, are little bags or sacks, placed between the tendons and bones, where there is much friction. These sacks are composed of proper membranes, containing a kind of mucous fat. The *bursæ mucosæ* are of different sizes and firmness, and are connected by the cellular membrane to articular cavities, tendons, ligaments, or the periosteum. Their use is to secrete and contain a substance to lubricate tendons, muscles and bones, in order to render their motions easy.

The *bursæ mucosæ* is a part of natural anatomy, which is necessary for the surgeon to be well acquainted with, because after sprains and injuries of that kind, an effusion takes place in them, presenting a puffy swelling over the joint, not easily understood unless we are acquainted with the situation of the *bursæ*.

Bursæ Mucosæ of the Head.

1. *A bursa of muscle 9.* This is situated in the eye socket.

2. *A bursa of muscle 41.* This is situated in the internal surface of the tendon of that muscle.

3. *A bursa of mus. 55.* This is situated between the hook-like processes of the *sphenoid* bone, and the tendon of that muscle.

4. *A bursa of muscle 47.* This is situated between the *os hyoides* and larynx.

Bursæ mucosæ about the Shoulder Joint.

5. *The external acromial.* This is situated under the *acromion*, between the caracoid process, muscle 129, and capsular ligament.

6. *The internal acromial.* This is situated above the tendons of muscles 126 & 127.

7. *The caracoid bursa.* This is situated near the root of the caracoid process.

8. *The clavicle bursa.* This is found where the clavicle touches the caracoid process.

9. *The subclavian bursa.* This is situated between the tendon of muscle 92 and the first rib.

10. *The caraco-brochial.* This is situated between the origin of muscle 130, and the capsular ligament.

11. *A bursa of muscle 91.* This is situated under the head of the humerus, between the internal surface of the tendon of that muscle, and another bursa placed on the long head of the biceps muscle.

12. *An external bursa of muscle 128.* This is situated under the head of the *os humeri*, between it and the tendon of that muscle.

13. *An internal bursa of muscle 128.* This is found

within the muscle where the fibres of its tendons diverge.

14. *A bursa of muscle 103.* This is situated between the tendon of this muscle and the os humeri.

15. *Ilumero bicipital bursa.* This is found in the sheath of the tendon of the biceps.

Bursæ near the elbow joint.

16. *The radio-bicipital.* This is situated between the tendons of muscles 132, 133, and the anterior tubercle of the radius.

17. *The cubito-radial.* This is situated between the tendons of muscles 134, 146, and the ligament common to the radius and ulna.

18. *The aconeal bursa.* This is situated between the olecranon and tendon of muscle 135.

19. *The capitulo-radial bursa.* This is situated between the tendons of muscles 138, 139, and the round head of the radius.

Bursæ on the inside of the Wrist and Hand.

20. A large bursa, for the tendon of muscle 153.

21. *Four short bursa.* These are situated on the fore part of the tendons of muscle 151.

22. *A large bursa.* This is situated behind the tendon of muscle 153, between it and the fore part of the radius, capsular ligament of the wrist and os trapezium.

23. *A large bursa* behind the tendons of muscle 152, and on the fore part of the end of the radius, and fore part of the capsular ligament of the wrist.

24. *An oblong bursa.* This is situated between the tendon of muscle 144 and the os trapezium.

25. *A very small bursa.* This is situated between the tendon of muscle 142, and the os pisiforme.

Bursæ on the back part of the Wrist and Hand.

26. *A bursa,* between the tendon of muscle 147, and the radius.

27. *A large bursa,* between the tendons of muscles 137 & 138.

28. *A bursa,* at the insertion of muscle 138.

29. *An oblong bursa.* This is situated on the tendon of muscle 137.

30. *A bursa* between the tendons of the extensors of the fore, middle and ring fingers.

31. *A bursa* for the extensor of the little finger.

32. *A bursa* between the tendon of Muscle 141, and ligament of the wrist.

Bursæ near the Hip Joint.

33. *The Ileo-puberal.* This is situated between muscles 89, 90, and the capsular ligament of the hip.

34. *The pectineal.* This is situated between the tendon of muscle 167 and the thigh bone.

35. *A small bursa,* situated between muscle 172, and the great trochanter.

36. *A bursa* of muscle 171, situated between its tendon and the great trochanter.

37. *The gluteo-fascial.* This is situated between muscles 170 and 179.

38. *The tubero-ischiatic bursa.* This is situated between muscle 84, the posterior spine of the ischium, and its tuberosity.

39. *The obturatory bursa.* This is situated between muscle 84 & 174 near the capsular ligament of the hip.

40. *A bursa of the semi-membranosu.* This is situated under the long head of muscle 184.

41. *The gluteo trochanteral bursa.* This is situated between the tendon of muscle 89 and the root of the great trochanter.

42. *Two gluteo-femoral bursæ.* These are situated between the tendon of muscle 170, and os femoris or thigh bone.

43. *A bursa of muscle 175,* situated between it and the little trochanter.

44. *The iliac bursa.* This is situated between the tendon of muscle 90, and the little trochanter.

Bursæ mucosæ near the Knee joint.

45. *The supra-genual,* which adheres to the tendons of muscles 178, 179, and 180, and the fore part of the thigh bone.

46. *The infra-genual bursa.* This is situated under the ligament of the patella or knee pan.

47. *The anterior genual.* This is situated between the tendon of muscle 177, and the internal and lateral ligament of the knee.

48. *The posterior genual.* This is situated between the tendons of muscles 183, 186, the capsular ligament, and the internal condyle.

49. *The popliteal.* This is situated between the tendon of muscle 185, and the external condyle of the thigh bone.

50. *The bursa of muscle 184.* This is situated between the tendon of that muscle, and the external lateral ligament of the knee.

Bursæ of the Foot.

51. *A bursa of muscle 189.* This is situated be-

tween the tendon of that muscle, the lower part of the tibia, and capsular ligament of the ankle.

52. *A bursa* of muscle 193. This is situated between its tendons, the tibia and the ligament of the ankle.

53. *A bursa* between the tendon of muscle 194, the tibia, and capsular ligament of the ankle.

54. *A bursa* common to the tendon of muscle 196.

55. *A bursa* of muscle 190. This is situated between the tendon of that muscle, the tibia and astragalus.

56. *Five bursæ of the flexor tendons of the toes.* These begin a little above the first joint of each toe, and extend to the root of the third phalanx or bone of the toe.

The surgeon who makes himself acquainted with the anatomy of the bones, together with the origin and insertion of the different muscles, will have but little difficulty from this brief description of the situation of the *bursæ mucosæ*, to determine on their relative situations.



SYSTEM OF ANATOMY.

PART THIRD.—OF MUSCLES.

THE parts that are called muscles, consist of distinct portions of flesh, susceptible of contraction and relaxation; the motions of which, in a natural and healthy state, are subject to the will, and for this reason they are called *voluntary muscles*. Besides these there are other parts of the body, that owe their power of contraction to their muscular fibres: thus the heart is a muscular texture, forming what is called the hollow muscle; and the urinary bladder, stomach, and intestines, are enabled to act upon their contents, merely because they are provided with muscular fibres; these are called *involuntary muscles*, because their motions are not dependent on the will. The muscles of respiration being in the same measure influenced by the will, are said to have a *mixed motion*.

The names by which the voluntary muscles are distinguished, are founded on their size, figure, situation, use, or the arrangement of their fibres, or their origin and insertion; but besides these particular distinctions, there are certain general ones that require to be noticed. Thus, if the fibres of a muscle are placed parallel with each other, in a straight direction, they form what anatomists term a *rectilinear muscle*, (i. e.) a muscle consisting of straight lines; if the fibres cross and intersect each other, they constitute a *compound muscle*; when the fibres are disposed in the manner of rays, it is termed a *radiated muscle*; when they are placed oblique with respect to the tendon, it is denominated a *peniform muscle*. Muscles that act in opposition to each other, are called *antagonists*; thus

every extensor has a flexor for its antagonist. Muscles that concur in the same action are termed *congeneres*. Muscles being attached to the bones, the latter may be considered as levers that are moved in different directions by the contraction of those organs. That end of the muscle which adheres to the most fixed part is usually called the origin; and that which adheres to the more moveable part, the *insertion*. In almost every muscle, two kinds of fibres are distinguished; one is soft, of a red color, sensible, and irritable, called *fleshy fibres*; the other is of a finer texture, of a white glistening color, insensible, without irritability, or the power of contracting, and named *tendinous fibres*. The tendinous fibres are occasionally intermixed, but the fleshy fibres generally prevail in the belly, or middle part of the muscle, and the tendinous ones in the extremities. If these tendinous fibres are formed into a round slender cord, they are termed the *tendon*, or what is vulgarly called the leader of the muscle; on the other hand, if they are spread into a broad flat surface, it is termed an *aponeurosis*.

The fibres that compose the body of a muscle are disposed in *fasciculi*, or bundles, which are easily distinguished by the naked eye; but these bundles are divisible into smaller ones, and so on *ad infinitum*. Each muscle is surrounded by a very thin and delicate covering of cellular membrane, which encloses it as it were in a sheath, and dipping down into its substance, surrounds the most minute fibres we are able to trace, connecting them to each other, lubricating them by means of the fat which its cells contain in more or less quantity in different subjects, and serving as a support to the blood vessels, lymphatick, and nerves, which are so plentifully distributed through the muscles.

Anatmoists have distinguished three kinds of mus-

cular motions; namely, *voluntary*, *involuntary*, and *mixed*. The voluntary motions of muscles, are such as proceed from an immediate exertion of active powers of the will: thus the mind directs the arm to be raised or depressed, the knee to be bent, the tongue to move, &c. The involuntary motions of muscles are those which are performed by organs, seemingly of their own accord, without any attention of the mind, or consciousness of its active powers, as the contraction and dilation of the heart, arteries, veins, absorbents, stomach, intestines, &c. The mixed motions are those which are in part under the control of the will, but which ordinarily act without being conscious of their acting; this is perceived in the muscles of respiration, the intercostals, the abdominal muscles, and the diaphragm.

When a muscle acts, it becomes shorter and thicker; both its origin and insertion are drawn towards its middle. The sphincter muscles are always in action; and so likewise are antagonist muscles, even when they seem at rest. When two antagonist muscles move with equal force, the part which they are designed to move remains at rest; but if one of the antagonist muscles remains at rest, while the other acts, the part is moved towards the center of motion.

The most of anatomical writers have arranged muscles according to their several uses; but the method here adopted, is the order in which they are situated, beginning with those that are placed nearest the skin, and proceeding from these to the muscles that are more deeply seated.

The muscles are all in pairs, except muscles 1, 19, 59, 66, 67, 75, 80, 81, and 86, and are estimated at one hundred and ninety-eight pairs, making in all four hundred and five.

MUSCLES OF THE INTEGUMENTS OF THE CRANIUM.

1. *Occipito frontalis*. This is a single, broad, digastric muscle, that covers the cranium, pulls the skin of the head backwards, raises the eye-brows upwards, and at the same time, draws up and wrinkles the skin of the forehead. This muscle arises from the back part of the *occiput*, (bone IV) goes over the upper part of the *os parietale*, (bone II) and *os frontis*, (bone I) and is inserted into the skin of the eye-brows, and muscle 3.

2. *Corrugator supercilii*. This is a small muscle situated on the forehead. It arises fleshy from the internal angular process of the *os frontis*, (bone I) above the joining of the *os nasi*, (bone IX) and nasal process of the upper jaw bone, from thence it runs outwards, and a little upwards; and is inserted into the inner and lower fleshy part of muscle 1, where it joins with muscle 3, and extends outwards as far as the middle of the ridge on which the eye brows are placed. When one muscle acts, it draws towards the other, and projects over the inner canthus or corner of the eye. When both muscles act, they pull down the skin of the forehead, and make it wrinkle, particularly between the eye brows.

Muscles of the Eye Lids.

3. *Orbicularis palpebrarum*. A muscle common to the palpebræ or eyelids. It arises from the orbital process of the upper jaw bone, and from a tendon near the inner angle of the eye; it then runs a little downwards, then outwards, over the upper part of the cheek, below the eye socket, covering the under eye lid, and surrounding the external angle, thence over the ridge

above the eyes towards the inner angle, where they intermix with those of muscle 1, and 2; then covering the upper eye lids, they descend to the inner angle opposite to its lower origin, and is inserted into the nasal process of the upper jaw bone. The use of this muscle is to shut the eye, by drawing both eye-lids close together.

4. *Levator palpebræ superioris.* A muscle of the upper eye-lid, that opens the eyes, by drawing the eye-lids upwards. It arises from the upper part of the *foramen opticum*, or hole which transmits the optic nerve, and is inserted by a broad thin tendon into the cartilage that supports the upper eye-lid.

Muscles of the Eye-Ball.

5. *Rectus superior oculi.* The uppermost straight muscle of the eye. It arises from the upper part of the *foramen opticum*, or hole which transmits the optic nerve, and is inserted into the upper and fore part of the *sclerotic membrane* by a broad and thin tendon. Its use is to raise the globe of the eye.

6. *Rectus inferior oculi.* This muscle arises from the lower part of the *foramen opticum*, or hole which transmits the optic nerve, and is inserted opposite to the inner angle of the eye. Its use is to turn the eye towards the nose.

7. *Rectus internus oculi.* The internal straight muscle of the eye. It arises from the inferior part of the *foramen opticum*, or opening which transmits the optic nerve, and is inserted into the *sclerotic membrane*, opposite the inner angle. Its use is to turn the eye towards the nose.

8. *Rectus externus oculi.* The outer straight muscle of the eye. It arises from the long partition be-

tween the *foramen opticum*, or opening which transmits the optic nerve, and *foramen lacerum*, another opening for nerves, and is inserted into the *sclerotic membrane*, opposite to the outer angle of the eye. Its use is to move the eye outwards.

9. *Obliquus superior oculi*. An oblique muscle of the eye. It arises like the straight muscles of the eye, from the edge of the *foramen opticum*, or opening which transmits the optic nerve, between muscles 5 and 7; from thence it runs along a portion of bone V to the upper part of the orbit, where a cartilagenous *trochlea* or pulley is fixed to the inside of the internal angular process of bone I, through which its tendon passes, and runs a little downwards and outwards, to be inserted into the membrane with the others. Its use is to roll the globe of the eye, and turn the pupil downwards and outwards.

10. *Obliquus inferior oculi*. This muscle arises by a narrow beginning from the outer edge of the orbital process of the upper jaw-bone, near its junction with the lachrymal bone, and running obliquely outwards, is inserted into the *sclerotic membrane* of the eye. Its use is to draw the globe of the eye forwards, inwards, and downwards.

Muscles of the Nose and Mouth.

11. *Levator labi superioris alæque nasi*. A muscle of the mouth and lips. This muscle arises by two distinct origins; the first, broad and fleshy, from the external part of the orbital process of the upper jaw bone; the second from the nasal process of the upper jaw bone, where it joins with bone I. The first portion is inserted into the upper lip, the second into the upper lip and outer part of the *ala nasi* or wing of the

nose; Its use is to raise the upper lip and spread the nostrils.

12. *Levator labii superioris proprius*. This muscle arises immediately under the eye socket; it is broad at its origin; it lies flat, and runs obliquely downwards and inwards, and is inserted into the *filtrum* or gutter in the middle of the upper lip. Its use is to pull the upper lip and septum or division of the nose directly upwards.

13. *Levator anguli oris*. A muscle situated above the mouth. It arises thin and fleshy from the hollow of the upper jaw bone, near the root of the socket of the first grinder tooth, and is inserted into the angle of the mouth and under lip, where it joins with its antagonist. Its use is to draw the corner of the mouth upwards, and to make that part of the cheek opposite to the chin prominent as in smiling.

14. *Zygomaticus major*. This muscle arises from bone VIII, near the zygomatic suture, and is inserted into the angle of the mouth. The use of this muscle is to draw the corner of the mouth and under lip towards the origin of the muscle, and make the cheek prominent as in laughing.

15. *Zygomaticus minor*. This muscle arises from the upper prominent part of bone VIII, or cheek bone, above the origin of muscle 14; and descending obliquely downwards and forwards, is inserted into the upper lip, near the corner of the mouth. Its use is to draw the corner of the mouth obliquely outwards and upwards towards the external angle of the eye.

16. *Buccinator*; so named from its use in forcing the breath in sounding a trumpet. This is a large flat muscle, that forms the walls of the cheeks. It arises tendinous and fleshy, from the lower jaw, as far back

as the last grinder tooth; fleshy from the upper jaw, between the last grinder teeth and pterygoid process of bone VI, and is inserted into the angle of the mouth. Its use is to draw the angle of the mouth backwards and outwards, and contract its cavity, pressing the cheek inwards, by which, the food is thrust between the teeth.

17. *Depressor anguli oris.* This muscle arises broad and fleshy, from the under edge of the lower jaw, at the side of the chin, and is inserted into the angle of the mouth, joining with muscles 13 and 14. Its use is to pull down the corner of the mouth.

18. *Depressor labi inferioris.* This muscle arises broad and fleshy, from the under part of the lower jaw next to the chin, running obliquely outwards, is inserted into the edge of the under lip, extends along one half of the lip, and is lost in the red part. Its use is to pull the under lip and the skin on the side of the chin downwards, and a little outwards.

19. *Orbicularis oris.* A muscle of the mouth, formed in a great measure by those of the lips; the fibres of those of the upper ones descending, and those of the lower ascending, and decursating or crossing each other at the corner of the mouth, they run along the lip to join those of the opposite side, so that the fleshy fibres appear to surround the mouth like a *sphincter*. Its use is to shut the mouth, by contracting and drawing both lips together, and to contract all the muscles that assist in forming it.

20. *Depressor labii superioris alæque nasi.* This muscle arises thin and fleshy, from the upper jaw bone, immediately above the joining of the gums of the two fore teeth, and the tooth next to them; from thence it runs up under part of muscle 12, and is inserted into

the upper lip and root of the *ala nasi*, or wing, or side part of the nose. Its use is to draw the lip and *ala nasi* downwards and backwards.

21. *Constrictor nasi*. This muscle arises by a narrow beginning, from the root of the *ala nasi*, or wing of the nose, and spreads into a number of thin separate fibres, which run up along the cartilage in an oblique manner towards the ridge of the nose, where it joins with its fellow, and is inserted into the anterior extremity of the *os nasi* or bone of the nose, and nasal process of the upper jaw-bone. Its use is to press the wings, or sides of the nose inwards; but, if the fibres of muscle 1, which adheres to it, act, it then draws the sides outwards. It also corrugates, or wrinkles the skin of the nose, and assists in expressing certain passions.

22. *Levator labii inferioris*. This muscle arises from the lower jaw, at the roots of the fore teeth, and is inserted into the under lip and skin of the chin. Its use is to pull the parts into which it is inserted upwards.

Muscles of the Ear.

23. *Superior auris*. This muscle arises broad and circular from the expanded tendon of muscle 1, and is inserted into the back part of the *antihelix*, or inner circle of the external ear. Its use is to lift the ear upwards.

24. *Anterior auris*. This muscle arises from the *zygoma* or cavity under the zygomatic process of bone III, and is inserted by a tendon into that eminence on the helix or external ring of the ear, which divides the concha, or cavity of the ear.

25. *Posterior auris*. This muscle arises from the

external and back part of the mastoid process of bone III, and is inserted into the *septum* or division, which divides the concha, (cavity) and *scapha* or depression between the external and internal ring or circle of the ear. Its use is to draw the ear backwards, and stretch the cavity.

26. *Helicis major*. This muscle arises from the upper and acute part of the external ring of the ear, and is inserted into its cartilage, a little above the *tragus*, or small eminence of the external ear that is covered with hair. Its use is to depress the part of the cartilage of the ear into which it is inserted.

27. *Helicis minor*. This muscle arises lower than the one last described, and is inserted into the *crus* of the external ring of the ear, opposite to the *concha* or hollow of the ear. Its use is, to assist in contracting the external ear.

28. *Tragicus*. This muscle arises from the middle of the concha or hollow of the ear to the root of the tragus or small eminence, into the tip of which it is inserted. Its use is to draw the point of the tragus a little forward.

29. *Antitragicus*. This muscle lies on the antitragus or eminence of the outer ear, opposite the tragus, running up to be inserted into the edge of the concha or cavity of the ear, at the notch on the termination of the helix or external ring. Its use is to turn up the tip of the *antitragus* a little outwards, and to depress the antihelix or inner ring of the ear towards it.

30. *Transversus auris*. This muscle runs in scattered fibres on the back part of the ear, from the prominent part of the concha or cavity, to the outer side of the antihelix or internal ring of the ear.

31. *Laxator tympani*. A muscle of the internal ear, that draws the *malleus* or hammer obliquely for-

wards, towards its origin: consequently the *membrana tympani* or membrane that lines the internal cavity of the ear, is made less concave, or is relaxed.

32. *Membrana tympani*. This membrane which lines the cavity of the drum of the ear is possessed of muscular fibres. It consists of six laminæ or layers.

33. *Tensor tympani*. A muscle of the internal ear, which pulls the *malleus* or hammer, and muscle 32, towards the *petrous* or rough, hard portion of the temporal bone, by which means the *membrana tympani* is made more concave and tense.

34. *Stapedius*. A muscle of the internal ear, which draws the *stapes*, (bone XIX) obliquely upwards towards the cavity of the ear, by which the back part of its base is moved inwards and the front part outwards.

Muscles of the Lower Jaw.

35. *Temporalis*. This muscle arises fleshy, from a semicircular ridge of the lower and side part of bone II, from part of bone III, from the external angular process of bone I, from the temporal process of bone VI, and from a tendinous expansion which covers it; from these different origins the fibres descend in a radiated manner, and are inserted, by a strong tendon into the coronoid process of the lower jaw. Its use is to pull the lower jaw upwards, and press it against the upper, at the same time drawing it a little backwards.

36. *Masseter*. This muscle arises, by strong, tendinous, and fleshy fibres, which run in different directions, from the upper jaw-bone, where it joins bone VIII, and from the inferior and anterior part of the

zygoma; the external fibres standing backwards, and the internal forwards. This muscle is inserted into the angle of the lower jaw, and from that upwards to near the top of its *coronoid process*. Its use is to pull the lower jaw upwards, and by means of its oblique descension, a little forwards and backwards.

37. *Pterygoideus externus*. This muscle arises from the external plate of the *pterygoid process* of bone VI, and from the root of the *temporal process* of the same bone, and is inserted into a cavity of the neck of the *condyloid process* of the lower jaw. Its use is to pull the lower jaw forwards, and to the opposite sides; and to pull the ligament from the joint, that it may not be pinched during these motions: when both muscles act the fore teeth of the under jaw are pushed forwards beyond those of the upper.

38. *Pterygoideus internus*. This muscle arises, tendinous and fleshy from the inner and upper part of the internal plate of the *pterygoid process* of bone VI, filling all the space between the two plates, and is inserted into the angle of the lower jaw internally. The use of this muscle is to draw the jaw upwards; and obliquely towards the opposite side.

Muscles about the fore part of the neck.

39. *Platysma Myoides*. This is a broad thin muscle, situated on the side of the neck, immediately under the skin. It arises by a number of slender fleshy fibres, which all unite to form a thin muscle, running obliquely upwards along the side of the neck, adhering to the skin, and is inserted into the lower jaw. Its use is to assist muscle 17 in drawing the skin of the cheek downwards, and when the mouth is shut, it

draws all that part of the skin, to which it is connected, below the lower jaw upwards.

40. *Sterno-Cleido-mastoideus*. This muscle arises by two distinct origins: the front part arises tendinous and fleshy, from the top of bone XXVIII. near its junction with bone XXX; the posterior or back part, arises fleshy, from the upper and fore part of bone XXX; both of those unite a little above the anterior articulation of bone XXX, to form one muscle, which runs obliquely upwards and outwards, & is inserted, by a thick strong tendon, into the mastoid process of bone III. Its use is to turn the head to one side, and bend it forward.

Muscles between the lower jaw and os hyoides.

41. *Digastricus*. This muscle arises, by a fleshy belly, intermixed with tendinous fibres, from the fossa or depression at the root of the mastoid process of bone III. and soon becomes tendinous; runs downwards and forwards: the tendon passes through muscle 53, it then is fixed by a ligament to bone XVI; and having received from that bone an addition of tendinous and muscular fibres, runs obliquely forwards, turns fleshy again, and is inserted into the lower and fore edge of the chin or that part of the lower jaw thus termed. Its use is to open the mouth, by pulling the lower jaw downwards, and backwards; and when the jaws are shut, to raise bone XVI, and consequently the pharynx, or muscular bag, or swallow as it is commonly called, upwards, as in *degulgitating* or swallowing.

42. *Mylo-Hyoideus*. This muscle arises, from all the inside of the lower jaw, between the last grinder tooth and the middle of the chin, where it joins with its fellow and is inserted into the lower edge of the

basis of bone XVI. Its use is to pull bone XVI. forwards, upwards, and to one side.

43. *Genio hyoides*. This muscle arises, from a rough protuberance in the middle of the lower jaw internally, or on the inside of the chin, and is inserted into the basis of bone XVI. Its use is to draw this bone forwards to the chin.

44. *Genio-hyo-glossus*. This muscle arises, tendinous, from a rough protuberance in the inside of the middle of the lower jaw; its fibres run like a fan, forwards, upwards and backwards, and is inserted into the whole length of the tongue, and base of bone XVI, near its *cornu* or horn. Its use is to draw the lip of the tongue backwards into the mouth, and middle downwards; and also to draw the root of the tongue and bone XVI forwards, and to thrust the tongue out of the mouth.

45. *Hyo glossus*. This muscle arises, broad and fleshy, from parts 2, and 3, of bone XVI; the fibres run upwards and outwards, and are inserted into the side of the tongue. Its use is to pull the tongue inwards and downwards.

46. *Lingualis*. This muscle arises, at the root of the tongue, and runs forwards between muscles 44 and 45, and is inserted into the lip of the tongue, along with part of muscle 52. Its use is to contract the substance of the tongue, and bring it backwards, and to elevate the point of the tongue.

Muscles situated between bone XVI and the trunk.

47. *Sterno-hyoideus*. This muscle arises, thin and fleshy, from the cartilagenous extremity of the first rib, the upper and inner part of the breast bone, and from the collar bone where it joins with the breast

bone, and is inserted into the base of bone XVI. Its use is to pull bone XVI downwards.

48. *Omo-hyoideus*. This muscle arises, broad, thin, and fleshy, from the upper *rib* or *costa* of bone XXXI near the semilunar notch, and from the ligament that runs across it, thence ascending obliquely, it becomes tendinous below muscle 40; and, growing fleshy again, is inserted into the base of bone XVI near its *cornu* or horn. Its use is to pull bone XVI obliquely downward.

49. *Sterno-thyroideus*. This muscle arises, fleshy, from the whole of the upper edge of bone XXVIII, opposite to the cartilage of the first rib, from which it receives a small part of its origin, and is inserted into the surface of the rough line at the external part of the lower edge of the *thyroid cartilage*, a cartilage which forms a part of the *larynx*. Its use is to draw the larynx downwards.

50. *Thyro-hyoideus*. This muscle arises from the rough line, opposite to the one last described, and is inserted into part of the basis, and almost all of the cornu or horn of bone XVI or bone of the tongue. Its use is to pull bone XVI downwards, or the thyroid cartilage upwards.

51. *Crico-thyroideus*. This muscle arises from the *cricoid*, or ring-like cartilage of the *larynx*, and is inserted by two portions; the first, into the lower part of the thyroid cartilage, or portion of the larynx; second, into the inferior cornu or horn. Its use is to pull forwards and depress the *thyroid*, and to elevate and draw back the *cricoid* or ring-like cartilage of the larynx.

Muscles situated latterally between the lower jaw and bone XVI, or bone of the Tongue.

52. *Stylo-glossus*. This muscle arises, tendinous and fleshy, from the styloid process, and from a ligament that connects that process to the lower jaw, and is inserted into the root of the tongue, runs along its side, and is lost near its point. Its use is to draw the tongue sideways and backwards.

53. *Stylo-hyoideus*. This muscle arises by a round tendon, from the middle and inferior part of the styloid process of bone III, and is inserted into bone XVI, at the junction of the base and cornu or horn. Its use is to pull bone XVI, to one side, and a little upwards.

54. *Stylo-pharyngeus*. This muscle arises fleshy, from the root of the styloid process of bone III, and is inserted into the side of the pharynx or swallow, and thyroid cartilage upwards. Its use is to dilate and raise the pharynx or swallow, and thyroid cartilage upwards.

55. *Circumflexus*. This muscle arises from the spinous process of bone VI, and from some other parts near to it; it then passes over the hook of the internal plate of the pterygoid or wing-like process of bone VI, by a round tendon, which soon spreads into a broad membrane, and is inserted into the *velum pendulum palati*, or soft part of the palate, and the semilunar edge of the palate bone. Its use is to stretch the *velum* or upper and back part of the mouth, on each side of the root of the tongue, and to draw it downwards.

56. *Levator palati*. This muscle arises, tendinous and fleshy, from the extremity of the *pas petrosa*, or hard portion of bone III, and is inserted into the whole

length of the palate, as far as the root of the uvula, or small fleshy conical substance, hanging in the middle of the palate over the root of the tongue; where it unites with its fellow. Its use is to draw the *velum*, veil, or palate upwards and backwards, so as to shut the passage from the fauces or cavity behind the tongue into the mouth and nose.

Muscles situated about the cavity of the Fauces.

57. *Constrictor isthmi faucium.* This muscle arises by a slender beginning, from the side of the tongue, near its root; thence running upwards within the anterior arch, before the *amygdala* or tonsil glands of the throat, and is inserted into the middle of the palate at the root of the uvula, or conical substance hanging over the root of the tongue. Its use is to draw the palate towards the root of the tongue, which it raises at the same time, and with its fellow, contracts the passage between the two arches, by which it shuts the opening into the fauces or cavity behind the tongue.

58. *Palato-pharyngeus.* This muscle arises by a broad beginning, from the middle of the palate, at the root of the *uvula* or conical eminence hanging over the root of the tongue, and from the tendinous expansion of muscle 55, and is inserted into the upper and back part of the thyroid cartilage or part of the cartilage which forms the larynx. Its use is to draw the *uvula* and palate downwards and backwards; at the same time pulling the *thyroid cartilage* and *pharynx* or swallow upwards, and shortening it.

58. *Azygos uvula.* This muscle arises fleshy, from the extremity of the suture which joins the palate bones, runs down the whole length of the palate and uvula, adhering to the tendon of muscle 55, and is

inserted into the point of the uvula, or conical, fleshy substance that hangs down at the root of the tongue. Its use is to raise the uvula upwards and forwards; and also to shelter it.

Muscles situated on the back part of the pharynx.

60. *Constrictor pharynges superior.* This muscle arises from the *cuneiform process* of bone IV, from the *pterygoid process* of bone VI; from the upper and under jaw, near the roots of the last grinder teeth; and between the jaws; it is continued with muscle 16, and with some fibres from the root of the tongue, and from the palate, and is inserted into a white line in the middle of the pharynx or swallow, where it joins with its fellow, and is covered by the following muscle. Its use is to compress the upper part of the pharynx, and to draw it forwards and upwards.

61. *Constrictor pharyngis medius.* This muscle arises from the appendix of bone XVI, from the cornu or horn of that bone, and from the ligament which connects it to the *thyroid cartilage*, or portion of the larynx; the fibres of the superior part running obliquely upwards, covering a considerable part of the muscle last described, and terminating in a point, is inserted into the middle of the *cuneiform process* of bone IV. before the *foramen magnum*, and joins to its fellow at a white line in the middle and back part of the pharynx. Its use is to compress that part of the pharynx which it covers, and to draw it and bone VI, upwards.

62. *Constrictor pharyngis inferior.* This muscle arises from the side of the *thyroid cartilage*, and from the *cricoid*, or ring-like cartilage, and is inserted into the white line in the middle of the larynx, where it joins with its fellow; the superior fibres running oblique-

ly upwards, while the inferior fibres run more transversely; and covering the beginning of the œsophagus. Its use is to compress that part of the *pharynx* which it covers, and to raise it with the *larynx* a little upwards.

Muscles situated about the glottis or opening of the larynx at the bottom of the tongue.

63. *Crico arytenoideus posticus.* This muscle arises fleshy, from the back part of the cricoid cartilage, and is inserted into the back part of the base of the arytenoid cartilage, a cartilage which forms part of the larynx. Its use is to open the *rima glottides*, or opening of the larynx, through which the air passes in and out of the lungs, and, by pulling back the arytenoid cartilage, to stretch the ligament, so as to make it tense.

64. *Crico arytenoides lateralis.* This muscle arises fleshy, from the cricoid or ring-like cartilage of the larynx, and is inserted into the side of the base of the arytenoid cartilage near the muscle last described. Its use is to open the *rima glottides*, or opening of the larynx, by pulling the ligaments from each other.

65. *Thyreus arytenoidens.* This muscle arises from the under and back part of the middle of the *thyroid cartilage*, and running backwards and a little upwards, along the side of the glottis, is inserted into the *arytenoid cartilage*. Its use is to pull the *arytenoid cartilage* forwards, nearer to the middle of the *thyroid*, and consequently to shorten and relax the ligament of the *larynx*.

66. *Arytenoidens obliquus.* This muscle arises from the base of one *arytenoid cartilage*, and is inserted near the tip of the *arytenoid cartilage*. Its use is

to pull the two *arytenoid cartilages* towards each other.

67. *Arytænoideus transversus*. This muscle arises from the side of one *arytenoid cartilage*, and from near its articulation with the *cricoid*. The fibres run straight across, and are inserted, in the same manner into the other *arytenoid cartilage*. Its use is to shut the *rima glottides* or opening of the *larynx*, by bringing the two cartilages, with the ligament, nearer one another.

68. *Thyro-epiglottideus*. This muscle arises by a few pale separate fibres, from the *thyroid cartilage*, and is inserted into the *epiglottis*, or cartilage situated at the root of the tongue, that shuts the passage into the *glottis* as in swallowing. Its use is to draw the *epiglottis* obliquely downwards; or, when both act, directly upwards; and at the same time, it expands the soft cartilage.

69. *Arytæno-epiglottideus*. This muscle arises by a number of small fibres, from the side and upper part of the *arytenoid cartilage*; and running along the outer side of the external *rima* or opening, is inserted into the *epiglottis* along with the former. Its use is to pull the side of the *epiglottis* towards the external *rima* or opening; or, where both act, to pull it close upon the *glottis*.

Muscles situated about the anterior part of the Abdomen.

70. *Obliquus descendens externus*. This muscle arises by eight different heads, from the lower edges of an equal number of the lower ribs, at a little distance from their cartilages: it always intermixes, in a serrated or saw-tooth manner, with portions of muscle 94, and generally to muscles 91, 95, 96, and 103. From these origins the fibres run obliquely downward

and forwards, and soon degenerate into a broad and thin *aponeurosis*, which terminates in the *linea alba* or tendinous expansion, extending from the *ensiform cartilage* to the *os pubis*. The *linea alba* is formed by muscles 70, 71 & 72: about an inch above the pubes, the fibres of this *aponeurosis* separate from each other so as to form an aperture, called the abdominal ring, this ring or opening is of an oval figure, and serves for the passage of the *spermatic chord* in males, and of the round ligament of the *uterus* in females, and is of a larger size in women than in men. The two tendinous portions, which, by their separation, form this aperture, are called the columns of the ring: the fibres of this muscle cross each other immediately below this opening, and are fixed to the *os pubis* (bone XXVII.) The use of this muscle is to draw down the ribs in expiration, or that part of respiration, in which the air is thrust out of the lungs; to bend the trunk or body forwards when both muscles act, or to bend it to one side, when either act singly; it also raises the pelvis obliquely when the ribs are fixed; it supports and compresses the *abdominal viscera*, assists in evacuating the urine, and fæces or stools; and is likewise useful in parturition.

71. *Obliquus ascendens internus*. This muscle arises from the spine of bone XXV, from bone XXII & the 3 lower lumbar vertebræ; & Poupart's ligament, or ligament extending from the upper & front surface of the spinous process of bone XXV, to the *crista* or upper part of bones XXVII, at the middle of which we find the round ligament of the *uterus* in women, and spermatic chord in men, passing under the thin edge of this muscle. From these different origins, the fibres of this muscle run in various directions; those of the upper portion ascend obliquely forwards; the middle ones be-

come less and less oblique, and at length run in a horizontal direction, and those of the anterior or fore portion extend obliquely downwards. The first of these are inserted, by very short, tendinous fibres, into the cartilages of the third, fourth and fifth false ribs; the fibres of the second, or middle portion, form a broad tendon, which after being inserted into the lower edge of the cartilage of the second false rib, extends towards the *linea alba*, (see mus. 70) and separates into two layers, the upper layer joins the tendon of muscle 70, and runs over the two upper thirds of muscle 73, and adheres to the fore surface of the tendon of muscle 72, and is inserted into the cartilage of the first of the false, and last of the true ribs, and likewise into the *linea alba*. The fibres of the portion arising from the spine of bone XXV, and Poupart's ligament likewise from a broad tendon which is inserted into the fore part of the pubes. This muscle serves to assist muscle 70; but seems to be better calculated than that muscle to draw the ribs downwards and backwards.

72. *Transversalis abdominis*. This muscle arises tendinous, from the cartilages of the seven lower ribs; by a broad thin tendon, from the transverse process of the lower vertebra of the back, and the four upper vertebræ of the loins; fleshy, from the whole spine of bone XXV, and from the tendon of muscle 70, where it intermixes with some of the fibres of muscle 71, and is inserted into the *cartilago ensiformis*, and into the whole length of the *linea alba*, (see mus. 70) excepting its lowermost part. Its use is to support and compress the abdominal contents, for which purpose it is well adapted.

73. *Rectus abdominis*. This muscle arises by two

heads, from the ligament of the cartilage which joins the two *ossa pubes* to each other; runs up the whole length of, and parallel to the *linea alba*, growing broader and thinner as it ascends, and is inserted into the cartilages of the 3 lower true ribs. Its use is to compress the forepart, but more particularly the lower part of the belly; and to bend the trunk forwards, or to raise the pelvis.

74. *Pyramidalis*. This muscle arises along with muscle 73, and running upwards, is inserted by an acute termination, near half way between bone XXVII, and the umbilicus, into the *linea alba* (see mus. 70) and inner edge of muscle 73. Its use is to assist the lower part of muscle 73.

Muscles about the Male Organs of Generation.

75. *Dartos*, so called from its raw appearance. The part under the *scrotum*, or common integuments which covers the testicles, is possessed of muscular fibres, by which, the skin of the *scrotum* is corrugated and relaxed.

76. *Cremaster*. This muscle arises from muscle 71, near the junction of bones XXV, and XXVII, over which part it passes, after having passed through the *abdominal ring*; (see muscle 70;) and then it descends upon the *spermatic chord*, & is inserted into the *tunica vaginalis* or membrane which covers the testicles, upon which it spreads and is insensibly lost. Its use is to suspend and draw up the testicles, and to compress them in the act of coition.

77. *Erector penis*. This muscle arises tendinous and fleshy, from the tuberosity of bone XXVI, and runs upwards, embracing the whole crus or root of the penis, and is inserted into a strong tendinous membrane that covers the *corpora cavernosa* or integument

of the penis. Its use is to compress the root of the penis, by which the blood is pushed from it into the fore part of the *corpora cavernosa*, and the penis is by that means more completely distended.

78. *Accelerator urinæ*. This muscle arises fleshy, from muscle 80 and membranous part of the *urethra* or urinary canal; and tendinous, from the root of the penis, and is inserted into a line in the middle of the bulb of the *urethra*, where it joins with its fellow, by which the bulb is completely enclosed. Its use is to drive the urine and semen forwards, by grasping the bulb of the *urethra*, to push the blood towards its *corpus cavernosum* and the glans, or head of the penis, by which it is extended.

79. *Transversus perinei*. This muscle arises from the tough fatty membrane that covers the tuberosity of bone XXVI; from thence it runs transversely inwards, and is inserted into muscle 78, and into that part of the *sphincter ani* or muscle 80, which covers the bulb of the *urethra*. Its use is to dilate the bulb, and draw the perineum and verge of the anus a little outwards and backwards.

Muscles of the Anus.

80. *Sphincter ani*. This muscle arises from the skin and fat that surrounds the verge of the anus on both sides, nearly as far out as the tuber of bone XXVI; the fibres are gradually collected into an oval form, and surround the extremity of the rectum, and is inserted before, by a narrow point into the perineum, muscle 78 and 79; and behind, by an acute termination, into the extremity of the *os coccygis*, or bone XXIII. Its use is to shut the passage through the anus into

the rectum, and pull down the bulb of the urethra, by which it assists in ejecting the urine and semen.

81. *Levator ani.* This muscle arises from bone XXVII within the pelvis, as far up as the upper edge of the *foramen thyroideum*, and joining of bones XXVI and XXVII; from the thin tendinous membrane that covers muscle 84; its fibres run down like rays from a circumference to a center, and is inserted into muscle 80, and into the anterior part of the two last bones of the *os coccyges* or bone XXII; surrounding the extremity of the rectum, neck of the bladder, prostate gland, and part of the *vesiculæ seminales*, or two membranous receptacles, situated on the back part of the bladder above its neck; so that its fibres behind and below bone XXIII, joining it with its fellow, they together very much resemble the shape of a funnel. Its use is to draw the rectum upwards after the evacuation of the *feces*, and to assist in shutting it; to sustain the contents of the pelvis, and to help in ejecting the semen urine, and contents of the rectum.

Muscles of the Female Organs of General.

82. *Erector clitoridis.* This muscle arises from the crus of bone XXIII internally, and in its ascent covers the crus or root of the clitoris, as far up as bone XXVII, and is inserted into the upper part of the crus and body of the clitoris. Its use is to draw the clitoris downwards and backwards; and to make the body of the clitoris more tense, by squeezing the blood into it, from its crus or root.

83. *Sphincter vaginae.* This muscle arises from muscle 80, and from the posterior side of the vagina, near the perineum; from thence it runs up the side of the vagina, near the perineum; from thence it runs up

the side of the vagina, near its external orifice, opposite to the nymphæ, or membranous fold of the vagina, and covers the *corpus cavernosum* vaginæ, or integuments of the clitoris, and is inserted into the origin and body of the clitoris. Its use is to contract the mouth of the vagina, and compress its *corpus cavernosum*.

Muscles situated within the Pelvis.

84. *Obturator internus.* This muscle arises from more than one half of the internal circumference of the foramen thyroideum, formed by bones XXIII, and XXVII. Its inside is covered by a portion of muscle 81; and appears to be divided into a number of *fossiculi* or bundles, which unite and form a roundish tendon, that passes out of the pelvis, between the sacro ischiatic ligament, (see ligament 14) and tuberosity of bone XXVI; where it passes over the capsular ligament of the thigh bone, and is inserted by a round tendon, into the large pit at the root of the trochanter major (see bone XXXVIII.) Its use is to roll the thigh bone obliquely outwards.

85. *Coccygeus.* This muscle arises tendinous and fleshy, from the spinous process of bone XXII, and covers the inside of ligament 14; from this narrow beginning, it gradually increases to form a thin fleshy belly, intersperced with tendinous fibres, and is inserted into the extremity of bone XXII, and nearly the whole length of bone XXII. Its use is to support and move bone XXIII forwards, and to tie it more firmly to bone XXII.

Muscles situated within the cavity of the Abdomen.

86 *Diaphragma.* The midriff or diaphragm. A muscle that divides the *thorax* or heart from the abdomen or belly. It is composed of two portions; the first and upper of these arises by distinct fleshy fibres, from the *cartilago ensiformis* or part 3 of bone XXVIII, and from the cartilages of the seventh, and of all the inferior ribs in both sides. The fibres from this semi-circular origin, tend towards their center, and terminate in a tendon or aponeurosis, which is termed the *centrum tendinosum*, or tendinous center of the diaphragm. The second and lower portion arises from the vertebræ of the loins by two productions, of which that on the right side comes from the first, second and third vertebræ of the loins; that on the left side is somewhat shorter, and both these portions join and make the lower part of the diaphragm, which joins its tendons with the tendon of the upper portion, so that they make but one muscular partition. The diaphragm is covered by the *pleura* on its upper side and by the *peritonæum* on the lower side. It is pierced in the middle for the passage of the *vena cava*. and in its lower part for the *æsophagus*. The diaphragm in its natural situation is concave on its lower, and convex on its upper side; therefore when its fibres swell and contract, it must become plain on both sides, and consequently the cavity of the breast is enlarged to give liberty to the lungs to receive air in inspiration; and the stomach and intestines are pressed for the distention of their contents; hence, the use of this muscle is very considerable; it is the principal agent in respiration, particularly in inspiration; for when it is in action the cavity of the thorax is enlarged, especially at the sides where the lungs are chiefly situated; and as

the lungs must always be contiguous to the inside of the thorax and upper side of the diaphragm, the air rushes into them, to fill up the increased space. In expiration it is relaxed and pushed up by the pressure of the abdominal muscles upon the viscera of the abdomen; and at the same time that they press it upwards, they pull down the ribs, by which the cavity of the thorax is diminished, and the air suddenly pushed out of the lungs.

87. *Quadratus lumborum.* This muscle arises broad, tendinous, and fleshy from the back part of the spine of bone 25, and is inserted into the transverse processes of all the vertebræ of the loins, into the lower rib near the spine, and by a small tendon into the last vertebra of the back. Its use is to move the loins to one side, pull down the last rib, and, when both muscles act to bend the loins forwards.

88. *Psoas parvus.* This muscle arises fleshy, from the side of the two upper vertebræ of the loins, and sends off a small long tendon, which ends thin and flat, and is inserted into the brim of the pelvis, at the junction of the os ilium and pubis. Its use is to assist muscle 89 in bending the loins forwards, and, in certain positions, to assist in raising the pelvis.

89. *Psoas magnus.* This muscle arises fleshy, from the side of the body, and transverse process of the last vertebra of the back; and, in the same manner, from all those of the loins by as many distinct slips, and is inserted tendinous, into the trochanter minor; (see bone XXXVIII;) and fleshy into that bone, a little below the same trochanter. Its use is to bend the thigh forwards; or, when the inferior extremity is fixed, to assist in bending the body.

90. *Iliacus internus.* This muscle arises fleshy, from the last vertebra of the loins, from all the inner

lip of the spine of bone xxv, from the edge of that bone between its front spinous processes, and the *acetabulum*, or socket which receives the thigh bone, and from most of the hollow part of the os ilium, and is inserted along with muscle 89. Its use is to assist that muscle in bending the thigh, and to bring it directly forwards.

Muscles situated on the anterior part of the Thorax.

91. *Pectoralis major*. This muscle arises from the cartilagenous extremity of the fifth and sixth ribs, where it intermixes with muscle 70; from almost the whole length of the breast bone; and from near half of the front part of the collar bone, and is inserted by two broad tendons, which cross each other at the upper and inner part of the arm bone, just above the insertion of muscle 129. Its use is to move the arm forwards, and obliquely upwards, towards the breast.

92. *Subclavius*. This muscle arises tendinous, from the cartilage that joins the first rib to the sternum or breast bone, and is inserted after becoming fleshy, into the lower part of the clavicle, which it occupies from within an inch of the breast bone, as far outwards as its connexion, by a ligament, with the caracoid process of bone xxxi. Its use is to bring that bone forwards and downwards.

93. *Pectoralis minor*. This muscle arises tendinous and fleshy, from the upper edge of the third, fourth and fifth ribs, near where they join with their cartilages, and is inserted tendinous, into the caracoid process of bone xxxi; but soon grows fleshy and broad. Its use is to bring the scapula forwards and downwards, and to raise the ribs upwards.

94. *Serratus magnus anticus*. This muscle arises

from the nine upper ribs by an equal number of fleshy digitations, resembling the teeth of a saw, and is inserted fleshy into the whole base of the shoulder blade, (bone xxxi.) Its use is to move bone xxxi, forwards; and, when that bone is forcibly raised, to draw up the ribs.

Muscles situated between the ribs, and within the thorax.

95. *Intercostalis externi.* This muscle arises from the lower edge of each superior rib, and running obliquely downwards and forwards, is inserted into the lower edge of each inferior rib, as far back as the spine. The use of this muscle is to raise the ribs equally during inspiration.

96. *Intercostalis interni.* This muscle arises with the one last described; and is inserted in like manner, and exercises the same office.

97. *Triangularis.* This muscle arises fleshy, and a little tendinous, from all the length of part 3 of bone xxviii, and from the edge of bone xxviii, or breast bone, from whence its fibres ascend obliquely upwards, & outwards and is inserted by three triangular terminations, into the lower edge of the cartilages of the third, fourth, & fifth ribs. Its use is to depress the cartilages, and extremities of the ribs; and, consequently, to assist in contracting the cavity of the thorax.

Muscles situated on the fore part of the Neck: close to the Vertebrae.

98. *Longus colli.* This muscle arises tendinous and fleshy, from the bodies of the three upper vertebrae of the back, and from the transverse process of the third, fourth, fifth, and sixth vertebrae of the neck near their roots, & is inserted into the fore part of the

bodies of all the vertebrae of the neck, by as many small tendons, which are covered with flesh. Its use is to bend the neck gradually forwards, and to one side.

99. *Rectus capitis internus major.* This muscle arises from the front points of the transverse processes of the third, fourth, fifth, and sixth vertebræ of the neck, by four distinct beginnings, and is inserted into the *cuneiform process* of bone iv, a little before the *condyloid process*. Its use is to bend the head forwards.

100. *Rectus capitis internus minor.* This muscle arises fleshy, from the fore part of the body of the first vertebra of the neck, opposite to the superior oblique process, and is inserted near the root of the *condyloid process* of bone iv, under, and a little farther outwards, than muscle 99. Its use is to bend the head forwards.

101. *Rectus capitis lateralis.* This muscle arises fleshy, from the front part of the point of the *transverse process* of the first vertebra of the neck, and is inserted into bone iv, opposite to the *foramen stylo-mastoideum* of the temporal bone. Its use is to bend the head a little to one side.

Muscles on the back part of the Trunk.

102. *Trapezius.* This muscle arises by a strong tendon, from the lower part of the protuberance in the middle of bone iv, behind; and, by a thin membranous tendon, from the rough curved line that extends from the protuberance towards the mastoid process of the temporal bone, runs down along the nape of the neck, and covers the spinous process of the upper vertebra of the neck; but rises from the spinous process of the two lower vertebræ, and from the spinous pro-

cesses of all the vertebræ of the back; adhering, tendinous, to its fellow, the whole length of its origin, and is inserted fleshy, into the posterior half of the *clavicle* or collar bone; tendinous and fleshy, into the *acromion*, (see bone xxxi part 6) and into almost all the spine of the shoulder blade. Its use is to move the shoulder blade according to the three different directions of its fibres; the upper descending fibres draw it obliquely upwards; the middle transverse straight fibres draw it directly backwards; and the inferior ascending fibres draw it obliquely downwards and backwards.

103. *Labissimus dorsi*. This muscle arises by a broad thin tendon from the back part of the spine of bone xxv, from all the spinous process of bone xxii, and vertebræ of the loins, and from the seven lower vertebræ of the back; also tendinous and fleshy, from the extremity of the three lower ribs, a little beyond their cartilages by as many distinct slips, the inferior fibres ascend obliquely, and the superior run transversely, over the lower angle of the shoulder blade, and is inserted by a strong thin tendon, into the fore part of the back edge of the groove between the two tuberosities of the arm bone. Its use is to pull the arm backwards and downwards, and to turn it about at the shoulder joint.

104. *Seratus posticus inferior*. This muscle arises by a broad thin tendon, in common with that of the one last describrd, from the spinous processes of the two lower vertebræ of the back, and from the three upper vertebræ of the loins, and is inserted into the lower edge of the four lower ribs, at a little distance from their cartilages, by as many distinct fleshy slips. Its use is to depress the ribs into which it is inserted.

105. *Rhomboideus*. This muscle is divided into two portions: the first arises tendinous, from the spinous processes of the five upper vertebrae of the back, and is inserted into all the base of the scapula or shoulder blade below its spine. The second portion arises tendinous, from the three lower vertebrae of the neck, and is inserted into the base of the scapula or shoulder blade, opposite to its spine. The use of this muscle is to draw the shoulder blade obliquely upwards, and directly inwards.

106. *Splenius*. This muscle arises from the spinous processes of the four or five upper vertebrae of the back; tendinous and fleshy, from the five inferior vertebrae of the neck, and is inserted, into the five superior transverse processes of the vertebrae of the neck: and tendinous and fleshy, into the upper part of the mastoid process; and ridge of bone IV. Its use is to bring the head and upper vertebrae of the neck backwards and a little to one side; and, when both act, to pull the head directly backwards.

107. *Serratus superior posticus*. This muscle arises by a broad thin tendon, from the spinous processes of the three last vertebrae of the neck, and the two uppermost of the back, and is inserted into the second, third, fourth, and fifth ribs, by as many fleshy slips. Its use is to elevate the ribs and dilate the thorax.

108. *Spinalis dorsi*. This muscle arises from the spinous processes of the two uppermost vertebrae of the loins, and the three inferior of the back, by as many tendons, and is inserted into the spinous processes of the nine uppermost vertebrae of the back. Its use is to erect and fix the vertebrae, and to assist in raising the spine.

109. *Levatores costarum*. These muscles are divided into twelve distinct parts, or twelve parts on each

side, making in all twelve pairs. The first of those arises from the transverse process of the last vertebrae of the neck, and goes down to be inserted into the first rib near its tuberosity; and so all that follow arise from the transverse process, and go to the rib below, being very small and tendinous at either end; but the three last or lowermost of these arise from the second process above the rib to which they belong: they pass one rib to go into the one below it: they are consequently twice as long as the nine first are. Thus the *levatorcs costarum* are a succession of small muscles, for the direct purpose of raising the ribs.

110. *Sacro lumbalis*. This muscle arises tendinous without, and fleshy within, from the side, and all the spinous processes of bone XXII: from the posterior spine of bone XXI: and from the roots of the transverse process of the vertebrae of the loins, and is inserted into all the ribs, where they begin to be covered upwards, by as many long and thin tendons. Its use is to pull the ribs down, and assist to erect the trunk of the body.

111. *Longissimus cervicis*. This muscle arises in common with the one last described, and is inserted into all the *transverse processes* of the vertebrae of the back, chiefly by small double tendons; also, by a tendinous and fleshy slip, into the lower edge of all the ribs, except the two lowermost, at a little distance from their tubercles.

112. *Complexus*. This muscle arises from the transverse processes of the seven upper vertebrae of the back, and four lower of the neck, by as many distinct tendinous origins; in its ascent it receives a fleshy slip from the spinous process of the first vertebra of the back. From these different origins it runs upwards and is every where intermixed with tendinous

fibres, and is inserted tendinous and fleshy, into the inferior edge of the protuberance in the middle of bone iv, and into part of the covered line that runs forwards from that protuberance. Its use is to draw the head backwards, and to one side; and, when both act to draw the head backwards.

113. *Traheo-mastoidens.* This muscle arises from the transverse processes of the three uppermost vertebrae of the back, and from the five lowermost of the neck, and is inserted into the middle of the posterior side of the mastoid process of bone iv, by a thin tendon. Its use is to assist the muscle last described; but pulls the head more to one side.

114. *Levator scapulae.* This muscle arises tendinous and fleshy from transverse processes of the five upper vertebrae of the neck, by as many distinct slips, which soon unite to form a muscle that runs downwards and outwards, and is inserted fleshy, into the superior angle of the shoulder blade. Its use is to pull the shoulder blade upwards and a little forwards.

115. *Semi-spinalis dorsi.* This muscle arises from the transverse processes of the seventh, eighth, ninth, and tenth vertebrae of the back, by as many distinct tendons, which soon grow fleshy, and then become tendinous again; and are inserted into the spinous processes of all the vertebrae of the back above the eighth, and into the two lowermost of the neck, by as many tendons. Its use is to extend the spine obliquely backwards.

116. *Multifidus spinæ.* This muscle arises from the side and spinous processes of bone xxii, and from the back part of bone xxv; from all the oblique and transverse processes of the vertebrae of the back, and from those of the neck, except the three first, by as many distinct tendons, which soon grow fleshy, and

running in an oblique direction; are inserted by distinct tendons, into all the spinous processes of the vertebrae of the loins, of the back, and of the neck, except the first. When the different portions of this muscle act on one side, they extend the back obliquely, or move it to one side; but if they act together on both sides, they extend the vertebrae backwards.

117. *Semi-spinalis colli.* This muscle arises from the transverse processes of the six uppermost vertebrae of the back; by as many distinct tendons ascending obliquely under the *complexus*, (mus. 112,) and is inserted into the spinous processes of all the vertebrae of the neck, except the first and the last. Its use is to extend the neck obliquely backwards.

118. *Transversalis colli.* This muscle arises from the transverse processes of the five uppermost vertebrae of the back, by as many tendinous and fleshy origins, and is inserted into the transverse processes of all the vertebrae of the neck except the first & last. Its use is to turn the neck obliquely backwards and a little to one side.

119. *Rectus capitis posticus minor.* This muscle arises by a narrow beginning from a little protuberance in the middle of the back part of the first vertebra of the neck. ascending obliquely outwards, and is inserted tendinous and fleshy, into bone IV, near the mastoid portion of bone III. Its use is to turn the head backwards, and to assist a little in its rotation.

120. *Obliquus capitis superior.* This muscle arises from the transverse process of the first vertebra of the neck, and is inserted with muscle 119. Its use is to draw the head backwards.

121. *Obliquus capitis inferior.* This muscle arises

fleshy, from the spinous process of the second vertebra of the neck, its whole length; and, forming a thick fleshy belly, is inserted into the transverse process of the first vertebra of the neck. Its use is to give a rotary motion to the head.

122. *Scalenus*. It is situated at the side of the neck, between the transverse process of the vertebræ of the neck, and the upper part of the thorax. This muscle is divided into three portions; the anterior or fore portion arises from the transverse processes of the six inferior vertebræ of the neck, by as many short tendons, and descending obliquely outwards, is inserted tendinous and fleshy, into the upper side of the first rib, near its cartilage. The middle portion arises by distinct tendons, from the transverse processes of the four last vertebræ of the neck, and descending obliquely outwards and a little backwards, is inserted tendinous into the outer and upper part of the first rib, from its root to within the distance of an inch from its cartilage. The third and last portion arises from the transverse processes of the second, third, fourth and fifth vertebræ of the neck, by distinct tendons, and is inserted into the upper edge of the second rib, at the distance of about an inch and a half from its articulation, by a broad flat tendon. The use of this muscle is to move the neck to one side, when it acts singly, or to bend it forwards when both muscles act; and when the neck is fixed it serves to elevate the ribs, and dilate the chest:

123. *Interspinalis colli*. The spaces between the spinous processes of the vertebræ of the neck, is filled up with fleshy portions; which arises double from the spinous process of the inferior vertebræ of the neck: and ascends to be inserted in the same manner, into the spinous processes of the upper vertebræ of the

neck. The use of these fleshy bundles are to draw these processes nearer to each other.

124. *Intertransversalis*. These are distinct bundles of flesh, which are situated between the transverse processes of the vertebræ of the loins, back and neck. They arise from the inferior transverse process, and are inserted into the superior. Their uses are to draw these processes towards each other. Those situated in the back are rather tendons than muscles, serving to connect the spinal and transverse processes.

Muscles of the Upper Extremities.

125. *Supra-spinatus*. This muscle arises fleshy from all that part of the base of the shoulder blade that is above its spine; also from its spine and superior *costa* or rib; passing under the *acromion* or process of the shoulder blade, and adheres to the capsular ligament of the shoulder joint; and is inserted tendinous, into that part of the large protuberance on the upper head of the arm bone. Its use is to raise the arm upwards; and, at the same time to pu'l the capsular ligament from between the bones, that it may not be pinched.

126. *Infra-spinatus*. This muscle arises fleshy, from all that part of the base of the *scapula* or bone XXXI, that is between its spine and the inferior angle; from the spine as far as the cervix or neck of the *scapula* or shoulder blade. The fibres ascend and descend obliquely towards a tendon in the middle of the muscle, which runs forwards, and adheres to the capsular ligament of the shoulder joint, and is inserted by a short thick tendon, into the upper and middle part of the large protuberance on the upper head of the arm bone. Its use is to roll the *os humeri* or arm.

bone outwards; to assist in raising, and supporting it when raised; and to pull the ligament from between the bones.

127. *Teres Minor*. This muscle arises from all the round edge of the inferior *costa* or rib of the scapula or shoulder blade, and runs forwards, attaching itself to the capsular ligament of the shoulder joint, and is inserted tendinous, into the back part of the large protuberance on the upper head of the arm bone, a little behind and below the termination of the muscle last described. Its use is to roll the arm outwards, to draw it backwards; and to prevent the ligament from being pinched between the bones.

128. *Teres major*. This muscle arises fleshy from the lower angle of the shoulder blade, and from all that portion of its inferior *costa* that is rough and thicker than the rest; its fleshy fibres are continued over part of muscle 126, to which they firmly adhere, and is inserted by a broad, short, and thin tendon, into the ridge of the inner side of the groove, near the upper head of the arm bone. Its use is to roll the arm bone inwards, and to draw it backwards and downwards.

129. *Deltoides*. This muscle arises fleshy, from all the back part of the collar bone; tendinous and fleshy, from the spine and acromion of the shoulder blade; from these origins it runs in three different directions, (i. e.) from the clavicle or collar bone outwards and downwards; from the spine of the scapula or shoulder blade outwards, forwards, and downwards, and from the acromion, straight downwards; and is composed of a number of *fasciculi* or bundles which form a strong fleshy muscle, that covers the front part of the shoulder joint, and is inserted tendinous, into

the rough protuberance in the outer side of the arm bone, near its middle. Its use is to pull the arm directly outwards and upwards, and a little forwards or backwards, according to the different directions of its fibres.

130. *Coraco-brachialis*. This muscle arises tendinous and fleshy, from the fore part of the coracoid process of bone XXXI; adhering, in its descent to the short head of muscle 132, and is inserted tendinous and fleshy, about the middle of the external part of the arm bone, from thence it sends down a thin tendinous expansion to the internal condyle at the lower end of the arm bone, (*os humeri*.) Its use is to raise the arm upwards and forwards.

131. *Subscapularis*. This muscle arises fleshy, from all the base of the shoulder blade internally, and from its superior and inferior costæ or ribs, being composed of a number of tendinous and fleshy *fasciculi* or bundles, which make prints on the bone; they all join together, and fill up the hollow of the shoulder blade, and pass over the joint, adhering to the capsular ligament, and is inserted tendinous, into the upper part of the internal protuberance at the upper head of the arm bone. Its use is to roll the arm bone inwards, and to draw it to one side of the body, and to prevent the capsular ligament from being pinched.

Muscles situated on the os humeri, or bone XXXII.

132. *Biceps flexor cubiti*. This muscle as its name (*biceps*) purports arises by two heads. The first and outermost head called *longus*, begins tendinous from the upper edge of the *glenoid cavity* of the shoulder blade; passes over the head of bone XXXII, within the joint; and in its descent at the outside of the joint, is

enclosed in a groove near the head of the arm bone, by a membranous ligament that proceeds from the capsular ligament and adjacent tendons. The second, or innermost head, called *brevis*, tendinous and fleshy from the *coracoid process* of the shoulder blade. A little below the middle of the *os humeri* or bone of the arm, these heads unite, and are inserted by a strong round tendon, into the tubercle on the upper end of bone XXXIV (*radius*.) Its use is to turn the hand *supine* (i. e.) the palm of the hand up, and to bend the fore arm.

133. *Brachialis*. This muscle arises fleshly, from the middle of the *os humeri* or bone of the arm, at each side of the insertion of muscle 129, covering all the lower part of this bone, runs over the joint, and adheres firmly to the capsular ligament, and is inserted by a strong short tendon, into the *coronoid process* of bone XXXIII, (*ulna*). Its use is to bend the fore arm, and to prevent the capsular ligament of the joint from being pinched.

134. *Triceps extensor cubiti*. This muscle as its name indicates (*triceps*) arises by three different heads: the first called *longus*, arises somewhat broad and tendinous, from the inferior *costa* or rib of the shoulder blade, near its neck. The second head, called *brevis* arises by an acute, tendinous, and fleshy beginning, from the back part of the *os humeri* or bone of the arm, a little below its head outwardly. The third, called *brachialis externus*, arises by an acute beginning, from the back part of the *os humeri* or bone of the arm. These three heads unite lower than the insertion of muscle 128, and covers the whole of the back part of bone XXXII, (*os humeri*) and is inserted into the *olecranon* or process of the ulna bone XXXIII, and part-

ly into the condyles of the *os humeri* or bone of the arm, adhering firmly to the capsular ligament. Its use is to extend the fore arm.

135. *Anconeus*. This muscle arises tendinous, from the back part of the external condyle of bone XXXII, or bone of the arm; it soon grows fleshy, and is continued from the third head of muscle 134, and is inserted fleshy and thin, into a ridge on the outer and back edge of bone XXXIII, (*ulna*.) being continued some distance below the *olecranon* or joint of the elbow, and covered with a tendinous membrane. Its use is to assist in extending the fore arm.

Muscles situated on the Fore Arm or below the Elbow Joint.

136. *Supinator radii longus*. This muscle arises by an acute origin, from the external ridge of bone XXXII, (*os humeri*) above the external condyle, nearly as far up as the middle of that bone, and is inserted into the outer side of the lower extremity of bone XXXIV (*radius*.) Its use is to roll that bone outwards, and consequently the palm of the hand upwards.

137. *Extensor carpi radialis longior*. This muscle arises broad, thin, and fleshy, immediately below the one last described, from the lower part of the external ridge of bone XXXII, (*os humeri*.) above its external condyle, and is inserted by a round tendon, into the posterior and upper part of the metacarpal bone that sustains the fore finger. Its use is to extend and bring the hand backwards.

138. *Extensor carpi radialis brevior*. This muscle arises tendinous, from the external condyle of bone XXXII, (*os humeri*.) and from the ligament that con-

nects bone XXXIV, (radius,) to it and runs along the outside of the radius, and is inserted by a round tendon into the upper and back part of the metacarpal bone that sustains the middle finger. Its use is to assist muscle 137.

139. *Extensor digitorum communis.* This muscle arises by an acute, tendinous, and fleshy beginning, from the external condyle of bone XXXII, (os humeri,) where it adheres to muscle 140. Before it passes under the external annular ligament of the wrist, it divides into four tendons: and about the fore part of the metacarpal bones they recoll tendinous filaments to each other, and are inserted to the posterior part of all the bones of the four fingers, by a tendinous expansion. Its use is to extend all the joints of the fingers.

140. *Extensor indicis proprii.* This muscle arises with the one last described, and is appropriated entirely to the extension of the little finger. Some anatomists have considered this a slip of muscle 139. but we find that it passes under the annular ligament of the wrist in a separate channel, which is a good reason for making it a distinct muscle.

141. *Extensor carpi ulnaris.* This muscle arises tendinous from the external condyle of bone XXXII, (os humeri,) and fleshy from the middle of the ulna, where it passes over that bone, and is inserted by a round tendon, into the posterior and upper part of the metacarpal bone that sustains the little finger. Its use is to assist in extending the hand.

142. *Flexor carpi ulnaris.* This muscle arises tendinous from the internal condyle of bone XXXII (os humeri,) It has likewise a fleshy beginning from the outer side of the olecranon; between which, and the condyle of bone XXXIII, (ulna) passes to the fore arm; and a number of its fleshy fibres arise from the tendin-

ous membrane which covers the fore arm, and is inserted by a strong short tendon into the *os pisiforme* or bone IV of the carpus or wrist. At a little distance from its insertion a small ligament is sent off to the metacarpal bone that sustains the little finger. Its use is to assist in bending the arm.

143. *Palmaris longus*. This muscle arises tendinous, from the condyle of bone XXXII, (*os humeri*) but soon grows fleshy, and after a short progress, sends off a long slender tendon, and is inserted into the annular ligament of the wrist, and into a tendinous membrane that is expanded on the palm of the hand, named *aponeurosis palmaris*; which, above begins at the transverse annular ligament of the wrist; and, below, is fixed to the roots of the fingers. Its use is to bend the hand, and to stretch the membrane that is expanded on the palm.

144. *Flexor carpi radialis*. This muscle arises tendinous and fleshy, from the internal condyle of bone XXXII, (*os humeri*) and from the front part of the upper end of bone XXXIII, (*ulna*) where it firmly adheres to muscle 145, and is inserted by a flat tendon, into the fore and upper part of the metacarpal bone, that contains the fore finger, after running through a depression in the *os trapezium* or bone 5 of the carpus or wrist. Its use is to bend the hand, and to assist in pronation or turning the palm of the hand downwards.

145. *Pronator radii teres*. This muscle arises from all the internal condyle of bone XXXII, (*os humeri*) and tendinous from the coronoid process of bone XXXIII, (*ulna*) and is inserted tendinous, and fleshy, into the middle of the posterior part of bone XXXIV, (*radius*.) Its use is to roll that bone, together with the hand inwards.

146. *Supinator radii breves.* This muscle arises tendinous, from the external condyle of bone XXXII; (os humeri) tendinous and fleshy, from the external and upper part of bone XXXIII, (ulna,) and adheres firmly to the ligament that joins these two bones together, and is inserted into the head, neck, and tubercle of bone XXXIV, (radius) near the insertion of muscle 132, and ridge running from that downwards and outwards. Its use is to roll the radius outwards, and to bring the hand supine, or the palm upwards.

147. *Extensor ossis metacarpi pollicis manus.* This muscle arises fleshy, from the middle of the posterior part of bone XXXIII, (ulna) immediately below the insertion of muscle 135, from the posterior part of the middle of bone XXXIV, (radius,) and from the interosseous ligament, or ligament situated between the radius and ulna, and is inserted by two tendons into the os trapezium or bone 5 of the carpus or wrist, & back part of the metacarpal bone of the thumb. Its use is to extend the metacarpal bone of the thumb outwards.

148. *Extensor primi internodii.* This muscle arises fleshy, from the posterior part of bone XXXIII, (ulna) and from the ligament that is situated between ulna and radius, and is inserted tendinous, into the posterior part of the first bone of the thumb. Its use is to extend the first bone of the thumb obliquely outwards.

149. *Extensor secundi internodii.* This muscle arises by an acute, tendinous, and fleshy beginning, from the middle of the back part of bone XXXIII (ulna) and from the interosseous ligament that is situated between the ulna and radius; its tendon runs through a small groove at the inner and back part of the lower end of bone XXXIV (radius,) and is inserted into the last bone

of the thumb. Its use is to extend the last joint of the thumb obliquely backwards.

150. *Indicator.* This muscle arises by an acute, fleshy beginning, from the middle of the posterior part of the ulna, passes under the annular ligament of the wrist, and is inserted into the back part of the fore finger. Its use is to extend the fore finger.

151. *Flexor digitorum sublimis.* This muscle arises tendinous, and fleshy, from the internal condyle of bone XXXII, (os humeri,) tendinous from the coronoid process of the ulna, near the edge of the cavity that receives the head of bone XXXII; fleshy from the tubercle of that bone: and membranous and fleshy from the middle of the fore part of the radius. Its fleshy belly sends off four round tendons before it passes under the ligament of the wrist, and is inserted into the fore and upper part of the second bone of each finger, being divided near the extremity of the first bone for the passage of muscle 152. Its use is to bend the second joint of the fingers.

152. *Flexor digitorum profundus.* This muscle arises fleshy, from external side of bone XXXIII, (ulna,) and from a large share of the ligament which is situated between the two bones of the arm. It splits into four tendons, a little before it passes under the annular ligament of the wrist, and these pass through the slits in the tendons of muscle 151, and are inserted into the fore and upper part of the third or last bone of the four fingers. Its use is to bend the last joint of the fingers.

153. *Flexor longus pollicis manus.* This muscle arises by an acute fleshy beginning, from the upper part of bone XXXIV, (radius,) immediately below its tubercle, and is continued down for some space on the fore part of this bone: and fleshy from the internal

condyle of bone XXXII, (os humeri,) that terminates near the upper part of the origin from the radius, and is inserted into the last joint of the thumb, its tendon being confined by the annular ligament of the wrist. Its use is to bend the last joint of the thumb.

154. *Pronator radii quadratus.* This muscle arises broad, tendinous and fleshy, from the lower and inner part of bone XXXIII; the fibres run transversely, to be inserted into the lower and front part of bone XXXIV. Its use is to turn that bone, together with the hand inwards.

Muscles situated chiefly on the Hand.

155. *Lumbricalis.* This muscle arises thin, and fleshy from the inside, of the tendons of muscle 152, a little above the annular ligament of the wrist, under which it passes, and is inserted by long slender tendons into the outer side of the broad tendons of muscles 148 and 149, about the middle of the first joint of the fingers. Its use is to increase the flexion of the fingers while the long flexors are in full action.

156. *Flexor brevis pollicis manus.* This muscle is divided into two portions: the first arises from the sides of bones 5 & 6 of the carpus or wrist, and from the internal surface of the annular ligament of the wrist. The second head arises from bone 7 of the wrist, and from the base of the metacarpal bone of the little finger, and are inserted by the first head into the outer sesamoid bone of the thumb, and by the second into the inner sesamoid bones. Its use is to bend the first joint of the thumb.

157. *Oponeus pollicis.* This muscle arises fleshy, from bone 5 of the carpus or wrist, and annular ligament, and is inserted tendinous and fleshy, into the un-

der and front part of the metacarpal bone of the thumb. Its use is to bring the thumb inwards. opposite to the other fingers.

158. *Abductor pollicis manus.* This muscle arises by a broad tendinous and fleshy beginning, from the annular ligament of the wrist, and from bone 5 of the wrist, and is inserted tendinous, into the outer part of the root of the first bone of the thumb. Its use is to pull the thumb towards the fingers.

159. *Abductor pollicis manus.* This muscle arises fleshy, from almost the whole length of the metacarpal bone, that sustains the middle fingers; from thence its fibres are collected together, and are inserted tendinous, into the inner part of the root of the first bone of the thumb. Its use is to pull the thumb towards the fingers.

160. *Abductor indicis manus.* This muscle arises from bone 5 of the wrist, and from the superior part and inner side of the metacarpal bone of the thumb. & is inserted by a short tendon into the under and back part of the first bone of the fore finger. Its use is to bring the fore finger towards the thumb.

161. *Palmaris brevis.* This muscle arises from the annular ligament of the wrist, and tendinous membrane that is expanded on the palm of the hand, and is inserted by small bundles of fleshy fibres into the skin and fat that covers muscle 140, and into bone 4 of the wrist. Its use is to assist in extending the palm of the hand.

162. *Abductor minimi digiti manus.* This muscle arises fleshy, from bone 4 of the wrist, and from that part of the annular ligament next it, and is inserted tendinous, into the inner side of the upper end of the first bone of the little finger. Its use is to draw this finger from the rest.

163. *Abductor minimi digiti manus.* This muscle arises fleshy, from the thin edge of bone 8 of the wrist, and from that part of the annular ligament next to it, and is inserted tendinous, into the inner side and front part of the metacarpal bone of the little finger. Its use is to bend and bring the metacarpal bone of this finger towards the wrist.

164. *Flexor parvus minimi digiti.* This muscle arises fleshy from the outer side of bone 8 of the wrist, and from the ligament of the wrist which joins with that bone, and is inserted by a round tendon into the inner and anterior part of the upper end of the first bone of the little finger. Its use is to bend the little finger.

165. *Interossei interni.* These are three in number. The first is called *posterior indicis*; it arises tendinous and fleshy, from the brevis and inner part of the metacarpal bone of the fore finger, and likewise from the upper end of the one that supports the middle finger, & is inserted into the posterior convex surface of the first bone of the fore finger. The second and third called *prior annularis*, and *interosseus auricularis* arises, in the same manner, from the basis of the outside of the metacarpal bones that sustain the ring and little fingers, and are inserted into the outside of the tendinous expansion of muscle 139 that covers each of these fingers. These three muscles draw the fingers into which they are inserted, towards the thumb.

166. *Interossei externi.* There are four muscles included under this one name; the first of which, is called *abductor indicis manus*, arises from bone 5 of the wrist, and from the superior part, and inner side of the metacarpal bone of the thumb, and is inserted by a short tendon, into the outer and back part of the first bone of the fore finger. The second called *prior me-*

di, arises by two origins, from the roots of the metacarpal bones that sustain the fore and middle fingers, and is inserted into the tendinous expansion from muscle 139 which covers the back part of the middle finger. The third called *posterior medii*, arises by two origins, from the roots of the metacarpal bones, next to each other, that sustain the middle and ring fingers, and is inserted with part second. The fourth, called *posterior annularis*, arises from the roots of the metacarpal bones that sustain the ring and little finger, and is inserted into the inside of the tendon, on the back of the ring finger. The use of the *interossei externi* is to extend the fingers into which they are inserted, and likewise to draw them inwards towards the thumb, except the third, which from its situation and insertion, is calculated to pull the middle finger outwards.

Muscles of the Inferior Extremities.

167. *Pectinalis*. This muscle arises broad and fleshy, from the upper & anterior part of bone XXVII, (os pubis) immediately above the foramen thyroideum, and is inserted into the front and upper part of the *linea aspera* or rough line in the thigh bone, a little below the trochanter minor of the same bone, by a flat and short tendon.

168. *Triceps adductor femoris*. This muscle as its name (*triceps*) purports, arises by three distinct heads, viz:

1. *Adductor longus femoris*. This portion arises by a strong roundish tendon, from the upper and posterior part of bone XXVII, (os pubis) and is inserted tendinous, near the middle of the posterior part of the *linea aspera* or rough line of the thigh bone, being continued for some distance down it.

2. *Adductor brevis femoris.* This portion arises tendinous, from bone XXVII, (os pubis,) near where they join in the center, and is inserted tendinous and fleshy, into the inner and upper part of the linea aspera, or rough ridge on the thigh bone, from a little below the trochanter minor, to the beginning of the insertion of part 1.

3. *Adductor magnus femoris.* This portion arises a little lower down than the former, near the joining of the ossa pubis; tendinous and fleshy, from the tuberosity of bone XXVI, (os ischium); the fibres run outwards and downwards, and are inserted into almost the whole length of the linea aspera, into the ridge above the internal condyle of the thigh bone. The use of these three muscles, or triceps, are, to bring the thigh inwards and upwards, according to the different directions of their fibres; and, in some degree, to roll the thigh outwards.

169. *Obdurator externus.* This muscle arises fleshy, from the lower part of the inner origin of bone XXVI; (os ischium) surrounds the foramen thyroideum; a number of its fibres, arising from the membrane which fills up that foramen, are collected like rays towards a center, and pass outwards towards the root of the the back part of the neck of the thigh bone, and is inserted by a strong tendon, into the cavity at the inner and back part of the root of the trochanter major of the thigh bone, adhering in its course to the capsular ligament of the hip joint. Its use is to roll the thigh bone obliquely outwards, and to prevent the capsular ligament from being pinched.

170. *Gluteus maximus.* This muscle arises fleshy, from the back part of bone XXV; from the whole external side of bone XXII, below the posterior spinous process of bone XXV; (os ilium) and from the posteri-

or *sacro-ischiatic ligament*. All the fleshy fibres run obliquely forwards, and a little downwards, to form a thick broad muscle, which is divided into a number of strong fasciculi or bundles, and is inserted by a strong, thick and broad tendon into the upper and outer part of the *linea aspera* or rough ridge on the thigh bone. Its use is to extend the thigh, by pulling it directly backwards, and a little forwards.

171. *Gluteus minimus*. This muscle arises fleshy from a ridge that is continued from the upper anterior spinous process of bone XXV, and from the middle of the dorsum of that bone, as far back as its great niche, and is inserted by a strong tendon, into the fore and upper part of the trochanter major of the thigh bone. Its use is to draw the thigh bone outwards, and a little backwards; to roll the thigh bone outwards especially when it is bent.

172. *Gluteus medius*. This muscle arises fleshy, from the front superior spinous process of bone XXV, (os ilium) and from all the outer edge of the spine of that bone, except its posterior part, where it arises from the dorsum, and is inserted by a broad tendon, into the outer and upper margin of the trochanter major of the thigh bone. Its use is to draw the thigh bone outwards, and a little backwards.

173. *Pyriformis*. This muscle arises within the pelvis, by three tendinous and fleshy origins, from the second, third, and fourth pieces of bone XXII; (os sacrum) from thence growing gradually narrower, it passes out of the pelvis, below the niche in the back part of bone XXV, (os ilium) where it receives a few fleshy fibres, and is inserted by a roundish tendon, into the upper part of the cavity, at the inner side of the root of the trochanter major of the thigh bone. Its

use is to move the thigh a little upwards, and rolls it outwards.

174. *Gemini*. This muscle arises by two distinct origins; the upper from the spinous process, and the inferior from the tuberosity of bone xxvi; (os ischium) also, from the *posterior sacro-ischiatic ligament*. They are both united by a tendinous fleshy membrane, forming a purse for the tendon of muscle 84, to which they firmly adhere. Its use is to roll the thigh outwards & to preserve the tendon of muscle 84.

175. *Quadratus femoris*. This muscle arises tendinous and fleshy, from the outside of the tuberosity of bone xxvi; (os ischium;) and, running transversely, is inserted fleshy, into a rough ridge, continued from the trochanter major of the thigh bone to the trochanter minor. Its use is to roll the thigh outwards.

Muscles situated on the Thigh.

176. *Tensor vaginae femoris*. This muscle arises by a narrow, tendinous, and fleshy beginning, from the external part of the front superior spinous process of bone xxv, (os ilium,) and is inserted into the thigh bone a little below the trochanter major, into the inner side of the membranous expansion which covers the outside of the thigh. Its use is to stretch this membranous expansion, to assist in the adduction of the thigh, and somewhat in its rotation inwards.

177. *Sartorius*. This muscle arises tendinous, from the front superior spinous process of bone xxv, (os ilium) but soon grows fleshy, and is inserted by a broad and thin tendon, into the inner side of bone xxxix, (tibia,) near the inferior part of its tubercle. Its use is to bend the leg obliquely inwards, or to bring one leg across the other.

178. *Rectus femoris.* This muscle arises from the lower anterior spinous process of bone xxv, (os ilium,) and tendinous from the dorsum of the same bone, a little above the acetabulum or cavity for the head of the thigh bone: runs down over the front part of the neck of the thigh bone; the fibres not being straight, but running down like the plumage of a feather, obliquely outwards and inwards, from a tendon in the middle, and is inserted tendinous into the upper part of the patella or knee pan, from which a thin tendon runs down on the fore part of that bone, to terminate in a thick strong ligament, which is sent off from the lower part of the knee pan, and inserted into the tubercle of bone xxxix, (tibia.) Its use is to extend the leg, and in a powerful manner, by the intervention of the knee pan, like a pulley.

179. *Vastus externus.* This muscle arises broad, tendinous, and fleshy, from the root of the trochanter major of the thigh bone, and upper part of the linea aspera or rough ridge of the thigh bone, and is inserted into a large share of the upper part of the patella or knee pan; part of it ending in an aponeurosis, which is continued down to the leg, and in its passage is firmly fixed to the head of bone xxxix, (tibia.) Its use is to extend the leg.

180. *Vastus internus.* This muscle arises tendinous and fleshy, from between the fore part of the thigh bone and root of the trochanter minor, and from almost all the inside of the *linea aspera*, or rough ridge of the thigh bone, by fibres running obliquely downwards and forwards, and is inserted tendinous, into the upper and inside of the patella or knee pan, continuing fleshy lower than the one last described. Part of it likewise ends in an aponeurosis continued down to the leg, and

fixed in its passage to the upper part of bone xxxix. Its use is to extend the leg.

181. *Cruralis*. This muscle arises fleshy, from between the two trochanters of the thigh bone, and firmly adhering to the most of the fore part of the thigh bone, being connected to muscles 179 and 180, is inserted tendinous, into the upper part of the patella or knee pan, behind muscle 178. Its use is to assist in the extension of the leg.

182. *Semi-tendinosus*. This muscle arises tendinous and fleshy, in common with the long head of muscle 184, from the posterior part of the tuberosity of bone xxvi, (os ischium,) and sending down a long roundish tendon, which ends flat, is inserted into the inside of the ridge of bone xxxix, (tibia) a little below its tubercle. Its use is to bend the leg backwards & a little inwards.

183. *Semi-membranosus*. This muscle arises tendinous, from the upper and back part of the tuberosity of bone xxvi; sends down a broad flat tendon, which ends in a fleshy belly; and, in its descent, runs at first on the fore part of muscle 184, between it and muscle 183, and is inserted tendinous into the inner and back part of the head of bone xxxix, (tibia). Its use is to bend the leg and bring it directly backwards.

184. *Biceps flexor cruris*. This muscle arises by two distinct heads. The first called *longus*, rises in common with muscle 183, and from the upper and posterior part of the tuberosity of bone xxvi, (os ischium.) The second called *brevis*, arises from the linea aspera or rough ridge on the thigh bone, from this origin it descends to join with the first head, a little above the external condyle on the lower end of the thigh

bone, and is inserted by a strong tendon, into the upper part of the head of bone XL, (fibula.) Its use is to bend the leg.

185. *Popliteus*. This muscle arises by a round tendon, from the lower and back part of the external condyle of the thigh bone, then runs over the ligament that covers the knee joint; firmly adhering to it. As it runs over the joint, it becomes fleshy, and the fibres run obliquely inwards, being covered with a thin tendinous membrane, and is inserted broad, thin, and fleshy, into a ridge at the upper and internal edge of bone XXXIX, (tibia) a little below its head. Its use is to assist in bending the leg, and to prevent the capsular ligament from being pinched. After the leg is bent, this muscle serves to roll it inwards.

Muscles situated on the Leg.

186. *Gastrocnemius externus*. This muscle arises by two distinct heads. The first head arises from the upper and back part of the internal condyle of the thigh bone, and from that bone a little above its condyle, by two distinct tendinous origins. The second head arises tendinous, from the upper and back part of the external condyle of the thigh bone. A little below the knee joint, their fleshy bellies unite in a middle tendon; and, below the middle of bone XXXIX, (tibia.) it sends off a broad thin tendon, which joins a little above the lower extremity of the tibia or bone of the leg with the tendon of muscle 187.

187. *Gastrocnemius internus*. This muscle arises by two origins. The first is from the upper and back part of the head of bone XL, (fibula,) continuing to receive many of its fleshy fibres from the posterior part of that bone for some space below its head. The other

origin begins from the posterior and upper part of the middle of bone XXXIX; (tibia) and runs along the inferior edge of muscle 185 towards the inner part of the *tibia* or bone of the leg, from which it receives fleshy fibres for some way down. The tendon of this muscle where it unites with the former, forms a strong round chord which is called *tendo Achillis*, and is inserted into the upper or back part of bone 2 of the *tarsus* or instep, by the projection of which the *tendo Achillis* is at a considerable distance from the *tibia* or bone of the leg. Its use is to extend the foot, by bringing it backwards and downwards.

188. *Plantaris*. This muscle arises thin and fleshy, from the upper and back part of the root of the external condyle of the thigh bone, near the inferior extremity of that bone, adhering to the ligament that covers the joint in its descent, and is inserted into the inside of the posterior part of bone 2 of the *tarsus* or instep. Its use is to assist muscle 188, and to pull the capsular ligament of the knee from between the bones.

189. *Tibialis anticus*. This muscle arises tendinous and fleshy from the middle of that process of bone XXXIX, (tibia) to which bone XL, (fibula) is connected; it then runs downwards fleshy on the outside of the *tibia* or bone of the leg; from which, and the upper part of the *interosceus* ligament of the leg, it receives a number of distinct fleshy fibres; near the extremity of the *tibia* or bone of the leg, it sends off a strong round tendon, which passes under the annular ligament of the instep, and is inserted tendinous, into the inside of the *os cuneiforme interunum* one of the bones of the instep, and posterior end of the metatarsal bone that sustains the great toe. Its use is to bend the foot, by drawing it

upwards, and, at the same time, to turn the toes inwards.

190. *Tibialis posticus*. This muscle arises by a narrow fleshy beginning, from the fore and upper part of XXXIX, (tibia) just under the process that joins it to bone XL, fibula, then passing through a perforation in the upper part of the interosseous ligament of the leg, it continues its origin from the back part of the *fibula* or bone of the leg next the *tibia*, and from near one half of the last named bone, and is inserted tendinous, into the upper and inner part of bone 3 of the instep, being further continued to the *internum*, & *medium*, of bones 5 of the instep; besides it gives some tendinous filaments to bones 2 and 4 of the instep, and to the root of the metatarsal bone that sustains the middle toe. Its use is to extend the foot, and to turn the toes inwards.

191. *Peroneus longus*. This muscle arises tendinous and fleshy, from the fore part of the head of bone XL, the fibres running straight down; also from the upper and external part of the fibula, or bone of the leg, where it begins to rise into a round edge, as far down as to reach within a hand's breadth of the ankle, by a number of fleshy fibres, which run outwards towards a tendon, that sends off a long round one, and is inserted tendinous, into the outside of the root of the metatarsal bone that sustains the great toe, and by some tendinous fibres into the *cuneiforme internum* of the instep. Its use is to move the foot outwards, and to extend the foot.

192. *Peroneus brevis*. This muscle arises by an acute fleshy beginning, from above the middle of the external part of bone XL; (fibula) from the outer side of the anterior spine of this bone; as also from its round edge externally, the fibres running obliquely

outwards towards a tendon on its external side; it sends off a round tendon which passes through the groove at the outer angle, being there included under the same ligament with that of muscle 191; and a little farther it runs through a particular one of its own, and is inserted tendinous, into the root and external part of the metatarsal bone that sustains the little toe. Its use is to assist the former in pulling the foot outwards, and extending it a little.

193. *Extensor longus digitorum pedis.* This muscle arises tendinous and fleshy, from the upper and outer part of the head of bone xxxix, (tibia), and from the head of bone xl, (fibula,) where it joins with the tibia, or bone of the leg, and from the interosseous ligament of the leg; also from the tendinous expansion which covers the upper and outside of the leg by a number of fleshy fibres; and tendinous and fleshy, from the anterior spine of the fibula or bone of the leg. It splits into four round tendons under the annular ligament of the tarsus or instep, and each is inserted by a flat tendon into the root of the first joint of each of the four small toes, and is expanded over the upper side of the toes, as far as the root of the first joint. The use of this muscle is to extend all the joints of the four small toes.

194. *Extensor proprius pollicis pedis.* This muscle arises by an acute, tendinous, and fleshy beginning, some distance below the head and front part of bone xl, (fibula) along which bone it runs to near its lower extremity, connected to it by a number of fleshy fibres, which ascend obliquely towards a tendon, and is inserted tendinous, into the posterior part of the first and last joint of the great toe. Its use is to extend the great toe.

195. *Flexor longus digitorum pedis.* This mus-

cle arises by an acute tendon, which soon becomes fleshy, from the back part of bone xxxix, (tibia) some distance below its head, which beginning is continued down the inner edge of this bone by short fleshy fibres, ending in its tendon; also by tendinous, and fleshy fibres, from the outer edge of the tibia, and between this double order of fibres, muscle 190 lies enclosed. Having passed under two annular ligaments, it then passes through a depression at the side of the *os calcis*, or heel bone; and about the middle of the sole of the foot, divides into four tendons, which pass through the slits of muscle 198, and each one is inserted into the last joint of the four lesser toes. The use of this muscle is to bend the last joint of the toes.

196. *Flexor longus pollicis pedis*. This muscle arises tendinous, and fleshy, a little below the head of bone XL, (fibula) and its fibres continue to adhere to that bone almost to its extremity. A little above the heel it terminates in a round tendon, which after passing in a groove formed at the posterior edge of bone 1 of the tarsus or instep, and internal edge of bone 2 of the instep, in which it is secured by an annular ligament, and is inserted into the last bone of the great toe. Its use is to bend the toe.

Muscles chiefly situated on the Foot.

197. *Extensor brevis digitorum pedis*. This muscle arises tendinous, and fleshy, from the fore and upper part of bone 2 of the instep, and soon forms a fleshy belly, which is divided into four portions, sending off an equal number of tendons that pass over the upper part of the foot, under the tendons of the last described muscle, and is inserted by four slender tendons, into the tendinous expansion of muscle 193,

which covers the small toes, except the little one; also into the tendinous expansion of muscle 194 that covers the upper part of the great toe. The use of this muscle is to extend the toes.

198. *Flexor brevis digitorum pedis.* This muscle arises by a narrow fleshy beginning, from the inferior and posterior part of a protuberance of bone 2, of the instep; it soon forms a thick fleshy belly, which sends off four tendons that split, or divide for the passage of the tendons of muscle 195, and are inserted into the second bone of the four lesser toes. The use of this muscle is to bend the second joint of the toes.

199. *Lumbricales pedis.* This muscle arises by four tendinous and fleshy beginnings, from the tendon of muscle 195, just before its division, and is inserted by four slender tendons, into the inside of the first joint of the four lesser toes. The use of this muscle is to increase the flexion of the toes and to draw them inwards.

200. *Flexor brevis pollicis pedis.* This muscle arises tendinous, from the under and fore part of bone 2 of the instep, where it joins with bone 4, and from the *os cuneiforme externum* or bone of the instep, and is inserted into the internal and external sesamoid bones of the great toe, and into the first joint of the same. Its use is to bend the first joint of the great toe.

201. *Abductor pollicis pedis.* This muscle arises by a long thin tendon, from bones 2 and 3 of the instep, and from the root of the metatarsal bone of the second toe, and is inserted into the external sesamoid bone of the great toe, and root of the metatarsal bone of the same. Its use is to bring this toe nearer the rest.

202. *Abductor pollicis pedis.* This muscle arises

from the internal side of the tuberosity of bone 2 of the instep, and from a ligament which extends from this tuberosity to the sheath of the tendon of muscles 196, and also from the internal and inferior side of bone 3 of the instep, and other adjacent parts, and is inserted into the internal sesamoid bone, and the inferior and internal part of the root of the first bone of the great toe. Its use is to separate the great toe from the others, and to increase the curvature of the same.

203. *Abductor minimi digiti pedis.* This muscle arises tendinous and fleshy, from a semi circular edge of a cavity of the inferior part of a protuberance of bone 2 of the tarsus, and from the metatarsal bone of the little toe, and is inserted into the root of the first joint of the little toe. Its use is to bend the little toe, and its metatarsal bone, downwards, and to draw the little toe from the rest.

204. *Flexor brevis minimi digiti pedis.* This muscle arises tendinous from bone of the tarsus or instep; fleshy from the outside of the metatarsal bone that sustains the little toe, below its protuberant part, and is inserted tendinous into the front extremity of the metatarsal bone, and root of the first joint of this toe. Its use is to bend this toe.

205. *Transversalis pedis.* This muscle arises tendinous, from the under part of the anterior extremity of the metatarsal bone of the great toe, and from the internal sesamoid bone of the first joint, and is inserted tendinous, into the under and outer part of the anterior extremity of the metatarsal bone of the little toe, and ligament of the next toe. Its use is to contract the foot, by bringing the great toe, and the two outermost toes nearer to each other.

206. *Interossei pedis externi.* There are four muscles included under this appellation. The first arises

tendinous and fleshy, from the outside of the root of the metatarsal bone of the great toe, and from the root of the metatarsal bone of the next toe, its tendon is inserted into the inside of the tendinous expansion that covers the back of the toes. The second is placed in a similar manner, between the metatarsal bones of the fore and middle toes, and is inserted into the outside of the tendinous expansion on the back of the fore toe. The third and fourth are placed between the two next metatarsal bones, and are inserted into the outside of the middle and third toes. The first of these draws the fore toe inwards towards the great toe. The three others pull the toes, into which they are inserted, outwards. They all assist in extending the toes.

207. *Interossei pedis interni.* There are three muscles included under this appellation. They arise tendinous and fleshy, from the basis and inside of the metatarsal bones of the middle, the third, and little toes, terminating in a tendon that runs to the inside of the first joint of these toes, and from thence to their upper surface, where the tendons are lost in the tendinous expansion that is sent off from the extensors. Each of these three muscles serves to draw the toe into which it is inserted towards the great toe.



SYSTEM OF ANATOMY;

PART FOURTH.



OF THE MOUTH AND THROAT.

The cavity of the mouth is formed by the connection of the lips and cheeks to the upper and lower jaws; so that the teeth and *alveoli* or sockets for the teeth, may be considered as within the cavity. Above it is formed principally by the palatine processes of the upper jaw and palate bones. Below, the cavity is completed by several muscles, which proceed from almost the whole internal circumference of the lower jaw, and, by their connections with each other, with the tongue and bone XVI, (*os hyoides*) which form a floor or bottom to the cavity. The cavity of the mouth is lined by a very thin delicate membrane, which is a continuation of the skin from the face and lips. Under this skin, or membrane, there are many small glandular bodies of a roundish form, the secretory ducts of which pass through this membrane, to the inner surface of the mouth, for the purpose of lubricating it with the juices which they secrete.

TONGUE.

The tongue is a flat body of an oval figure, but subject to considerable changes of form. It is connected at the posterior or back extremity of bone XVI, (*os hyoides*), which is called its basis; the fore or front, and its apex or point. The lower part of the tongue is connected with a number of muscles,

which are continued into its substance. The connection of the tongue is such, that its edges and apex are perfectly free and unconnected. The substance of the tongue consists principally of muscular fibres intermixed with adipose, or fatty substance. The lining membrane of the mouth continues from the sockets of the teeth to the lower surface of the tongue, at which place it is very thin; but, as it proceeds to the upper surface of the tongue, its texture changes considerably; and on this surface it constitutes the organ of taste. The upper surface of the tongue, although it is continued from the thin membrane above described, is formed by a rough integument which consists, like the skin of three *laminae* or layers. The cuticle is very thin; and under it, the *retia mucosum* is thicker and softer than in other places. The true skin here abounds with eminences of various sizes and forms, which are called papillæ. The tongue answers a three fold purpose. It is the principal organ of taste. It is a very important agent in the articulation of words; and it assists in those operations upon our food, which are performed in the mouth.

THE SALIVARY GLANDS.

The salivary glands have such a close connection with the mouth, that they may be described with it. There are three principal glands on each side: the *parotoid*, the *submaxillary*, and the *sublingual*. They are of a whitish or pale fleshy color, and are composed of many small united masses, each of which sends a small excretory duct, to join similar ducts from the other, and thereby form the great duct of the gland. The parotoid gland is situated between the mastoid process of the temporal bone, and the back part of the

lower jaw. The ^{sub}maxillary gland, is situated immediately in the ^{an}^{ter} of the lower jaw. The sublingual gland, lies so, " when the tongue is turned up, it can be seen protruding into the cavity of the mouth, and covered by the lining membrane, which seems to keep it fixed in its place.

These glands secrete a fluid called saliva, which when in a healthy state is inodorous, insipid, and limpid, like water, but much more viscid, and of greater specific gravity. The use of this fluid is to moisten the mouth; to mix with the food, and prepare it for a reception in the stomach.



THE THROAT.

The word throat is here used as a general term to comprehend the structure of all the parts at the back part of the cavity of the mouth. This structure consists,

1. *Of the Tonsil, Amygdalæ.*

Betwixt the arches of the palate, on each side, lies a large oval gland. These glands are called the *tonsils*, or *amygdalæ*. These glands are covered with the lining membrane of these parts, the surface of which is full of small holes. These glands secrete a mucous, which is discharged through the small openings, the use of which is to lubricate the passage of the throat, and facilitate the swallowing. The *amygdalæ* are often inflamed, and swelled; when this is the case swallowing is difficult.

2. *Of the Larynx.*

In this structure there are five cartilages, upon which its form and strength depend, viz: the *cricoid*, the *thyroid*, the two *arytenoid*, and the *epiglottis*. These cartilages are joined to each other, and are supplied with muscles by which certain motions are effected.

The *cricoid* or ring-like cartilage forms the basis of this structure, which may also be considered as the commencement of the wind pipe.

The *thyroid*, or shield-like cartilage, is placed perpendicular to the *cricoid* cartilage, being bent in such a manner, as to form an acute angle with a broad surface on each side of it. The angular part is at a small distance above the front part of the *cricoid* cartilage, and connected to it by a ligamentous membrane: while its broad sides are connected to its sides, and thus partially covering it, both the upper and lower edges of the thyroid cartilage, terminate posteriorly in processes, which are called *cornua*, or horns.

The *arytenoid* cartilages are two small bodies of a triangular pyramidal form, but slightly curved backwards. They are placed upon the upper and back edge of the *cricoid* cartilage, near to each other, and their upper ends, taken together, resemble the mouth of a pitcher. These two cartilages are the posterior or back parts of the larynx.

The *epiglottis*. This cartilage, when divested of its membrane, is, of an oval form at its upper extremity, and rather angular below, terminating in a long narrow process. This cartilage is firmly attached to the internal surface of the angular part of the thyroid cartilage, to the tongue, and bone XVI, (*os hyoides*.) The *epiglottis* closes over the aperture of the larynx, and shuts up the passage from the mouth into the

larynx, when the back of the tongue is drawn backwards as in swallowing.

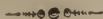
3. *Of the Pharynx.*

The pharynx is a large muscular bag which forms the great cavity at the back part of the mouth, terminating in the *œsophagus*, or swallow. It is connected above, to the *cuneiform process* of bone IV, (*os occipitis*) to the *pterygoid process* of bone VI, (*os sphenoides*), and to both the upper and lower jaw bones. Its use is to receive the food when masticated, and force it into the *œsophagus*.

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SYSTEM OF ANATOMY;

PART FIFTH.



OF THE THORAX.

BEFORE entering into a description of the thorax, it will be necessary in the first place to describe the *Mammæ*, or those glandular bodies situated on the anterior part of it, which, in females, are destined to the secretion of milk. These glands lie between the skin and muscles 91 and 93, and are attached to the surface of those muscles by a cellular membrane. They are of a circular form; and consist of a whitish firm substance, divisible into small masses, which are composed of still smaller masses. Between these glandular portions a great deal of adipose or fatty matter is so diffused, that, it constitutes a considerable part of the bulk of the *mammæ* or breasts. The breasts of the female becomes enlarged about the age of puberty. They are also very large during pregnancy and *lactation* or suckling; but after the period of child bearing, they diminish. They are supplied with blood by the external and internal mammary arteries, the branches of which enter them irregularly in several different places. From the small glandular portions that compose the mamma, fine excretory tubes arise, which unite together and form the great lactiferous ducts of the gland. Those ducts proceed in a radiated manner from the circumference to the centre, and terminate on the surface of the nipple. They are about fifteen in number, and vary considerably in size. The *papilla*,

or nipple, in which these ducts terminate, is in the centre of the mamma or breast: it consists of a firm elastic substance, and is nearly cylindrical in its form. The skin around the nipple is of a bright red color in virgins of mature age. In pregnant women it is sometimes almost black. The nipple abounds with sebaceous glands, which form small eminences on its surface. This gland also exists in males, although it is very small. In males soon after birth, it has also been known to tumefy, and become very painful, in consequence of the secretion and accumulation of a whitish fluid, which can be discharged by pressure. It also sometimes swells and is painful, in males at the age of puberty.

1. *Of the form of the cavity of the Thorax.*

The cavity of the thorax is formed by the upper ribs, the vertebræ, and breast bone. Its figure is between that of a circle and an oval; but is made irregular by the vertebræ, and by the upper edge of the breast bone. The *diaphragm* has a great effect upon the figure of the cavity of the thorax. It protrudes into it from below, with a considerable convexity; so, that although it arises from the lower margin of the thorax, the central parts of it are nearly as high as the fourth rib. The position of the diaphragm is also oblique. The front portion of its margin, being connected to the seventh and eighth ribs, is much higher than the back portion, which is attached to the eleventh and twelfth. In consequence of the figure and position of the diaphragm, the form of the cavity of the thorax has been compared to the hoof of an ox, when its back part is presented forwards.

3. *Of the arrangement of the Pleuræ.*

The *pleura*, is a membrane which lines the internal surface of the thorax, and covers its viscera. The cavity of the thorax is every where lined by this smooth and glistening membrane, which is in reality two distinct portions or bags, which, by being applied to each other latterally, from the *septum* or division called *mediastinum*, which is attached posteriorly to the vertebræ of the back, and in front to the breast bone; thus dividing the cavity of the thorax into two parts. But the two *laminæ*, or layers of which the mediastinum is formed, do not every where adhere to each other; for at the lower part of the thorax they are separated, to form a lodgment for the heart; and at the upper part of the cavity, they receive between them the thymus gland.

The surface of the *pleura*, like that of the *peritonæum*, and other membranes lining cavities, is constantly bedewed with a serous moisture, which prevents adhesion of the viscera, the mediastinum, by dividing the thorax into two cavities, obviates many inconveniences to which we otherwise should be liable. It prevents the two lobes of the lungs from compressing each other when lying on the side, and consequently contributes to the freedom of respiration, which is disturbed by the least pressure of the lungs. If a puncture be made between the ribs into the cavity of the thorax, the lungs on that side will cease to perform their office, while the other lobe, which is separated from it by the mediastinum, remains unhurt, and continues to perform its functions as usual.

2. *Of the Pericardium,*

This is the membranous sac which encloses the

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heart, which upon a superficial view, seems only connected with its great vessels; but which adheres closely to the whole of its surface. From this surface it is extended to those vessels; from which it proceeds, in a reflected manner, and forms an enclosure that lies loosely about the heart. The pericardium, thus arranged, is placed between the two laminæ, or folds of the mediastinum or division between the two lobes of the lungs: it adheres firmly to the mediastinum, and also to the diaphragm, and thus preserves the heart in its proper position. The pericardium is composed of two laminæ, folds or layers, the internal of which covers the heart, while the external extends over the loose portions of the other, and blends itself with the mediastinum. This membrane effuses or secretes a fluid, which keeps the heart lubricated and preserves it from adhering to the parts around it.

4. *Of the Heart.*

The heart is a hollow muscular viscus, situated in the cavity of the *pericardium*, for the circulation of the blood. It is divided externally into a base, or its broad part; a superior and inferior surface, and an anterior and posterior margin. Internally, it is divided into a right and left ventricle. The situation of the heart is oblique; its base being placed on the right of the bodies of the vertebræ, and its apex obliquely to the sixth rib on the left side; so that the left ventricle is almost behind, and the right before. Its lower surface lies upon the diaphragm. There are two cavities adhering to the base of the heart, called right and left *auricles*. The cavities in the heart are called *ventricles*, which are divided by a fleshy *septum*, called *septum cordis*, into right and left ventricles. Each

ventricle has two orifices; the one auricular, through which the blood enters, the other arterious, through which the blood passes out.

These four orifices are supplied with valves which are differently named. The substance of the heart is muscular; its exterior fibres are longitudinal, its middle transverse, and its interior oblique. The auricles of the heart contract and dilate together; the same thing takes place with the ventricles, the movements of which are simultaneous. When the contraction of the heart is spoken of, that of the ventricle is understood. Their contraction is called *systole*, and their dilation *diastole*. Every time the ventricles contract, the whole of the heart is carried forward with considerable force, the point of which strikes the left side of the chest, between the sixth and seventh true ribs.

5. *Of the Trachea or Wind Pipe.*

The wind pipe is a cartilaginous and membranous canal, through which the air passes into the lungs. Its upper part which is called the *larynx*, is composed of five cartilages, which has been previously described. This tube begins at the lower edge of the *cricoid* or ring-like cartilage, and passes down the neck in front of the *oesophagus* as low as the third vertebræ of the back, where it divides into two branches called *bronchia*, one of which goes to the right and the other to the left lung. In the structure of the wind pipe, there are a number of flat cartilaginous rings placed at small distances from each other, the edges of which are connected by a membrane, so that they compose a tube.

6. *Of the Lungs.*

There are two of these organs; each of which occupies one of the great cavities of the thorax. The lung in the right cavity of the thorax is divided into three lobes, that in the left cavity into two. They hang in the chest, attached at their superior part to the neck, by means of the *trachea*, or wind pipe, and are separated by the *mediastinum*. They are also attached to the heart by the pulmonary vessels.

The substance of the lungs is of four kinds, viz: *vesicular*, *vascular*, *bronchial*, and *parenchymatious*. The vesicular substance is composed of the air cells. The vascular invests those cells like a net work. The bronchial is formed by the ramification of the bronchia throughout the lungs, having the air cells at their extremities; and the spongy substance that connects these parts is termed *parenchyma*. The lungs are covered with a very fine membrane, a reflection of the pleura, called *pleura pulmonalis*. The internal surface of the air cells is covered with a fine, delicate, and sensible membrane, which is continued from the larynx through the wind pipe and bronchia. The lungs are not only useful in breathing, but also in changing the quality of the blood, which is circulated through them by the pulmonary artery.

SYSTEM OF ANATOMY;

PART SIXTH.



OF THE ABDOMEN.

This great cavity occupies more than half the space enclosed by the ribs, and all the anterior trunk of the body below the thorax. The different parts contained in the abdomen, are,

1. *Peritonium.*

The internal surface of the abdomen is lined by a thin firm membrane called peritoneum, which is very smooth on its internal surface, and is immediately connected with the cellular substance exterior to it. This membrane adheres closely to the front, side, and upper portions of the abdomen; and is extended from the back surface so as to cover, more or less completely, the contents of the cavity. Those contents which are in close contact with the back surface of the abdomen, as some portions of the large intestines, which are covered only on their front surface, & are fixed in their precise situation by the peritoneum; which extends from them to the contiguous surface of the cavity, and adheres where it is in contact, so as to produce this effect.

Other parts contained in the abdomen, which are not in close contact, but moveable to a distance from the posterior surface of the abdomen, are covered by this membrane, which is extended to them from the

surface; and this extended portion forms an important part of the connection of the viscus and the cavity in which it lies. This connecting part is called *mesentery*; when it passes to one of the large intestines, or *colon* it is called *mesocolon ligament* when it passes to some of the other *viscera*.

Some of the viscera, or parts contained in the abdomen are more completely invested with the peritoneum than others. The stomach, liver, and spleen, are almost completely surrounded by it; forming a coat for each of these. That portion of the smaller intestinal tube, which is called *jejunum* and *ileum*, and the transverse portions of the large intestines, called the *arch of the colon*, are invested by it in the same way. But a considerable portion of the *duodenum* and the *pancreas* are behind it. The *peritoneum*, which covers the stomach, is extended from the great curvature of that organ, so as to form a large membrane, which descends like an apron before the intestines. This process is composed of two *laminae* or folds of the *peritoneum*, so thin and delicate as to resemble the cellular membrane. The part of this process which is between the stomach and colon is called *epiploon* or *omentum*. This membrane supports the viscera of the abdomen in their proper situations, and also forms a surface for them, and for the cavities which contain them, so smooth and lubricated, that no injury can arise from their friction.

2. Of the Stomach.

Before entering into a description of the stomach it will in the first place be necessary to give a brief description of the *oesophagus*, which is a membranous and muscular tube that descends from the *pharynx* to

the stomach. It is composed of three *tunics*, or membranes, viz. common, muscular, and mucous. From the *pharynx*, the *œsophagus* passes dawnwards between the wind pipe and the vertebræ. The internal coat of the *œsophagus* or swallow, resembles that of the fauces of the mouth, and is covered with a very delicate cuticle. It is also very vascular, and abounds with the orifices of mucous follicles, from which is constantly poured out a mucous which facilitates deglutition or swallowing. The use of the *œsophagus* is to convey the masticated food from the mouth to the stomach.

The stomach, although of a very simple structure, is a very important organ, and one too, which exerts a powerful influence upon every part of the body. It is a membranous receptacle, situated in the left *hypochondriac* and *epigastric regions*, immediately below the liver, and receives the food from the *œsophagus*.

It is of considerable length, but incurvated. It is much larger at one extremity than the other, and changes so gradually in this respect, that it would appear conical if it were straight. It is not, however, strictly conical, unless when greatly distended; for when moderately distended, it is rather oval than circular. It is therefore considered as having two broad sides or surfaces, and two edges, which are the curvatures. The orifice in which the *œsophagus* terminates is at a small distance from its largest extremity, and is called *cardia*. The orifice which communicates with the intestines, is at the termination of its small incurvated extremity, and is called *pylorus*.

The situation of the stomach in the abdomen is nearly transverse; the great extremity is in the left hypochondriac region, and the lesser extremity in the

epigastric region, under the left lobe of the liver. The stomach is connected to the diaphragm, liver, colon, &c. It is composed of four laminæ or coats. There is first a coat or external covering continued from the peritoneum: within this, and connected to it by a delicate cellular substance, is a coat or stratum of muscular fibres: next to this, is a layer of dense cellular substance, called a nervous coat; and last is the internal coat called *villous* or fungous, from the structure of its surface.

The internal coat of the stomach is generally covered, or spread over with mucous, which is effused upon it by secreting organs. Besides the mucous, a large quantity of a different fluid, called *gastric juice*, or fluid of the stomach is effused from its surface.

3. *Of the Intestines.*

The intestines form a continual canal from the *pylorus*, or lower opening of the stomach to the anus, which is generally six times the length of the subject to which they belong. Although the different parts of this tube appear somewhat different from each other, they agree in their general structure. The coats of which they are composed, are much like those of the stomach.

Although there is a considerable degree of uniformity in the structure of the intestinal canal, different parts of it are very distinguishable from each other by their outward appearance, by their size, their investments, and their position.

The first portion of the intestinal tube, for about the extent of twelve fingers' breath, is called the duodenum; it lies in the epigastric region; makes three turnings, and between the first and second turning receives by a common opening, the pancreatic duct, together with the biliary. It is in this portion of the intestines that

chyfication is chiefly performed. The remaining portion of the intestines is distinguished by the names of *jejunum* and *ileum*.

The jejunum, which commences where the duodenum ends, is situated in the umbilical region, and is mostly found empty; it is every where covered with red vessels, and, about an hour and a half after a meal, with distended lactacls.

The ileum occupies the *hypogastric* region and the pelvis: It is of a paler color than the other, and terminates by a transverse opening into the large intestines, which is called the valve of the ileum.

The beginning of the large intestine is firmly tied down in the right iliac region, and from the extent of about four fingers' breadth is called the *cæcum*. The great intestine called colon then commences, and ascends towards the liver, passes across the abdomen, under the stomach, to the left side, where it is contorted like the letter S, and descends to the pelvis; at which place it takes the name of *rectum*, from whence it proceeds in a straight line to the anus.

4. Of the Omentum.

The omentum is an extension of the *peritoneum*, in two *laminæ* or folds, arising from the concave surface of the liver to the lesser curvature of the stomach; and these laminæ or folds, after surrounding the stomach, come in contact with each other near its great curvature. From this portion of the stomach, from the commencement of the duodenum, and also from the spleen, the *omentum*, composed of two laminæ or folds, descends over the colons and the small intestines more or less low into the abdomen; it is then folded backwards, and upwards, and is continued until it meets

the great arch in the colon; here the laminæ or folds separate and enclose that part of the intestine, on the posterior side of which they again approach each other, and form a membrane like the mesentery, of two *lamine* or layers, which pass from the concave or posterior surface of the colon to the back of the abdomen, where it is continued into the membrane which lines that surface. This last portion is called *messocolon*. The portion between the liver and stomach, is called the *omentum of Winslow*, or the lesser *omentum*; and the great portion between the stomach and colon, is called the great *omentum*. The great and small *omentum*, with a portion of the *peritoneum* on the back of the abdomen, form a sac, which encloses a distinct cavity in the abdomen. The front part of this sack is composed of two laminæ, and between these laminæ are the stomach and the great arch of the colon. This cavity formed by the two *omenta*, communicates with the general cavity of the abdomen by a foramen of a semicircular form, which is behind the great cord of the vessels that go to the liver.

The use of this membrane in the animal economy has not as yet been ascertained with any certainty. It seems probable that one of its principal objects is to protect the small intestines, and lessen the friction consequent upon their motion; but it has been supposed to answer several other important purposes.

5. *Of the Liver.*

The liver is the largest *viscus*, or organ of the abdomen, and is situated in the right *hypochondriac region*, which it occupies entirely; and extends through the upper portion of the *epigastric* into the left *hypochondriac region*, being placed immediately under the

diaphragm, and in close contact with it, as well as with the inner surface of the right *hypochondriac* region, it partakes of their form, and is convex above and concave below.

The ligaments of the liver are five in number, all arising from the *peritoneum*.

1. *The right lateral ligament*, which connects the right lobe of the liver with the posterior part of the diaphragm.

2. *The left lateral ligament*, which connects the convex surface and margin of the left lobe with the diaphragm, and sometimes with the *œsophagus* and spleen.

3. *The broad ligament*, which passes from the diaphragm into the convex surface, and separates the right lobe of the liver from the left. It descends from above through a large fissure to the concave surface, and is then distributed over the surface of the whole liver.

4. *The round ligament*, which may be traced from the umbilicus, and is formed by the degenerated coats of the great vein, which brings the florid blood from the placenta into the veins of the liver, and from thence into the right side of the heart of the *fœtus*.

5. *The coronary ligament*, which is formed in consequence of the attachment of the liver to the diaphragm.

The liver is divided into a right and left lobe, which is marked on the convex surface in the first place by the broad ligament; between the great lobes there is a small one, which is called *lobulus spigelii*, this however, belongs to the right lobe: a little below this is a process, which has been named *lobulus caudatus*, stretching downwards from the middle of the right lobe to the *lobulus spigelii*. The front point of the

great lobe of the liver is called *lobulus anonymus*.

There belongs to the liver five distinct systems of vessels; viz: the *vena porta*; the *arteria hepatica*; the *venæ cavæ hepatica*; the *lymphatics*; and the *billiary ducts*. These with the nerves, form a very intricate system of vessels, which should be well studied and understood by every physician, who wishes to administer medicine successfully.

The right lobe of the liver has the gall bladder attached to it, and is partly buried in its proper sinus, or depression. It has sometimes occurred that it was merely suspended to the liver by a membrane like a mesentery. The gall bladder is a bag of a pyriform shape; its greater end or fundus, is contiguous to the colon; its lower end or neck to the duodenum. It is generally of a size to contain an ounce, or an ounce and a half of bile. The gall bladder is considered as a receptacle, reserving a sufficient store of bile for the due change to be performed upon the food.

The liver as all other glands has its ducts, which are termed *billiary ducts*. The vascular *glandulus* which compose almost the whole substance of the liver, terminating in very small canals, or ducts, which at length form one trunk, the *ductus hepaticus*. Their use is to convey the bile, secreted by the liver, into the *hepatic duct*; this uniting with the duct from the gall bladder, forms one common canal, called the *ductus communis chaledochus*, which conveys the bile into the intestinal canal.

The secretion of bile is effected like all other glandular secretions; modified, of course, by the peculiar structure of the liver. The liver differs from every other secretory apparatus, in having two kinds of blood distributed to it:—arterial blood by the hepatic artery; and venous blood by the *vena portae*. A question

has consequently arisen—from which of these is the bile formed. Anatomical inspection throws no light upon the subject, but it is generally believed that the bile is formed by the venous blood.

The bile appears to answer a two fold purpose in the animal economy. It produces a chemical effect upon the alimentary mixture which passes from the stomach through the intestines; and it increases the peristaltic motion of those important organs. By an inverted action of the duodenum, some of this fluid is frequently carried upwards into the stomach; it then often produces only slight derangement of the functions and sensations connected with that viscus or organ; but sometimes violent vertigo, and even convulsions, seem to have arisen merely from the presence of a large quantity of bile in the stomach: for they have gone off completely upon the discharge of bile by vomiting.

Notwithstanding these effects of bile in certain cases, in which a great deal of it exists in the stomach, it is often carried into the mass of blood in large quantities, and appears to be mixed with the semen, and to circulate through the body, without producing any very sensible effect; and neither the brain nor the heart appear to be much influenced by it.

6. *Of the Panchreas.*

The panchreas is a glandular body of the abdomen, of a long figure, compared to a dog's tongue. It is seven inches in length, and is irregularly oblong in its form, one extremiity being much larger than the other. Its large extremity is in contact with the duodenum, from which it extends in a transverse direction to the spleen, to which it is connected by the omentum and by

blood vessels. It is not invested by the peritoneum, but is situated in the space which exists between the two laminae of the mesocolon, as they proceed from the back of the abdomen, before they come in contact with each other, consequently its situation is in the epigastric region under the stomach.

This gland differs from the other large glands of the abdomen, inasmuch as it has not a large artery particularly appropriated to it; but instead of this, it receives branches from the contiguous arteries.

The *panchreas* resembles the salivary glands in color, and also in texture, and appears to consist of small bodies of a granulated form, which are so arranged as to compose small masses or lobes that are united to each other by a cellular membrane. Each of these granulated bodies receive one or more arterial twigs, and from it proceeds not only a vein but a small excretory duct, which, uniting with similar ducts forms a large duct in each lobe or mass; these open into the great duct of the gland, which proceeds through it lengthwise from the left extremity, in which it commences, to the right; this duct in most cases unites with the biliary duct before it enters into the duodenum; sometimes they open separately, but very near to each other.

The use of the *panchreas* is to secrete the pancreatic juice, which is to be mixed with the chyle in the duodenum. The quantity of this fluid secreted is uncertain; but it must be considerable, if we compare it with the weight of the saliva, the *panchreas* being three times larger, and seated in a warmer place. The use of this fluid is to dilute the *viscid cystic bile*, to mitigate its acrimony, and to mix it with the food.

7. *Of the Spleen.*

The spleen or milt is a spongy viscus of a purple color, and so variable in form, situation and magnitude, that it is hard to determine either; however in a healthy man it is in general placed in the left side, in the *hypochondriac region*, between the eleventh and twelfth false ribs. It is of an irregular oblong form, with thick edges; and is commonly about three or four in breadth; but it has often been found more than four times this size. The substance of the spleen is very spongy, tender, and soft; and is connected to the stomach, omentum, diaphragm, pancreas, colon, and the left kidney, by ligament, vessels, &c.

The spleen is covered by one simple membrane, arising from the peritoneum, which adheres to the spleen, very firmly, by the intervention of the cellular structure. The spleen receives blood from the splenic artery.

The use of the spleen has not hitherto been determined; yet if the situation and fabric regarded, one would imagine its use to consist chiefly in affording some assistance to the stomach during the progress of digestion.

Among all the notions that I have as yet read of relative to the use of the spleen, I have not found one that satisfies my mind: and the only use that I can ascribe to it, is, that it serves the same purpose to the living animal that a regulator does to a watch, (i. e.) preventing the animal from going too long or fast; for it is a well known fact, that when the blood becomes very much heated, that it rushes into the spleen and produces an acute pain, which, not unfrequently compels a person to stop. Were it not then for the spleen,

man would be liable to overheat his blood, and thereby, produce inflammatory complaints.

6. *Of the Kidnies.*

The kidneys are two glandular bodies which secrete the urine. They are of a dull red color, and their form has a strong resemblance to that of a bean, called kidney bean. They are situated in the lumbar region of the abdomen, one on each side of the spine. They are opposite to the two last dorsal vertebræ, and the two first lumbar. They are surrounded with a large quantity of loose adipose membrane, which in corpulent persons forms a very large mass of fat around them. Each of the kidneys receives a very large artery; which proceeds immediately from the aorta. A vein which opens into the *vena cava*, accompanies the artery.

There is a part called *pelvis*, and another *ureter*, attached to the kidneys, which receive and convey the urine from the kidneys to the bladder. This is the most extensive secretion, accomplished by any of the glandular structures of the body.

Of the Urinary Bladder.

The urinary bladder is a large sac of a muscular & membranous structure, which occupies the front part of the cavity of the pelvis, immediately within the *ossa pubis*. The size of the bladder is in a continued state of variation, according to the quantity of urine secreted. When moderately distended, it is of an irregular oval form, but rather more flat at its lower extremity than above. It arises in form according to the different circumstances of the pelvis. It is fixed firmly and immoveably to the pelvis immediately with-

in the *symphysis pubis*; so that it is always to be found there of a smaller or larger size.

There is some difference in the situation of the bladder with regard to sex. In males the relative situation of the bladder and rectum is such, that the upper and middle part of the rectum is behind the bladder. In females the vagina and uterus are situated between the bladder and rectum; so that the connection of these last mentioned parts is very different in the two sexes.

The bladder is composed of a coat consisting of muscular fibres, of a stratum of cellular substance immediately within this, and of an internal lining membrane, which has been called *villous*, but as there are no *villa* perceptible on it, may be more properly denominated mucous. It should be observed, that in addition to these coats, the bladder has a peculiar investment of the peritoneum; and also of the common cellular membrane, which is placed between it and every part to which it is contiguous. The functions of the kidneys is to secrete urine, and that of the bladder to retain it, until the proper time for evacuation.

9. *Of the Male Organs of Generation.*

These organs consist of three different parts, viz: the testicles and their apendages, vesiculæ seminalis, prostate gland, and of the penis.

1. *The testicles* are two bodies of a flattened oval form. Each of them has a protuberance on its upper and posterior part called *epididymis*, and is connected to parts within the cavity of the abdomen by a thick cord which proceeds to it through the abdominal ring. Each testicle also appears to be contained in a sac,

which is suspended by this cord and covered by the common integuments, which is denominated *scrotum*. The *scrotum* or skin appears very often to be in a state of corrugation; but does not differ from the structure of the skin in any other part of the body. There is a small raised line in the middle of this skin, which commences at the root of the penis, and proceeds backwards, dividing it into two equal parts; this line is denominated *raphe*.

The chord above named, which is called the *spermatic chord*, proceeds to the testicles, through the abdominal ring, appears at first view like a bundle of muscular fibres; but it consists of an artery and veins, with many lymphatic vessels and nerves, and also the excretory ducts of the testicles, connected to each other by cellular substance, and covered by an expansion of muscular fibres, which are derived from the lower edge of muscle 71. In addition to these vessels the *vas deferens* which is much firmer than either of them, is always to be distinguished in the back part of the cord. They are all covered in front and on the sides by the cremaster muscle, which passes with them from the lower margin of muscle 71, through the abdominal ring, and continues to the upper part of the external coat of the testicle, which is a sac apparently containing that organ, and upon this sac it is spread out and terminates.

The external coat of the testicles to which the spermatic cord is attached is called *tunica vaginalis*: it is a complete sac enclosing the testicles as the *pericardium* does the heart. The body of the testicle is very firm, in consequence of being enclosed in a firm coat called *tunica albuginæ*. The body of the testicle, when the *tunica albuginæ* is cut through, appears to consist

of a soft pulpy substance of convoluted threads of a yellowish brown color, which is divided into separate portions by a very delicate septa or divisions, attached to the internal surface of the *tunica albuginea* at the back part of the testicle. At the origin of these septa or partitions, there is a body, of a whitish substance, which extends lengthwise on the back part of the testis, for the support of the ducts which pass from the substance of the testicle to the epididymis. This substance is called *corpus Hyrmorianum*.

The blood vessels pass into the body of the testicle upon these septa or partitions and one continued from them to the filaments or tubes of which the body of the testicle consists.

The cavity formed by the *tunica albuginea* is divided into a number of apartments by the thin partitions above mentioned. From these departments, proceeds a number of small tubes, which run a straight course, and are called *vasa recta*. These unite with each other and form a net-work on the back of the testis, within the *tunica albuginea*, which is called *reta testis*. From this net work other vessels proceed, running through the albuginea epididymis, called *vasa efferentia*. These vessels are convoluted in such a manner as to form bundles of a conical form, and are called *coni vasculosi*. These compose about one third of the epididymis, viz: all the upper part of it. The single tubes which form each of these cones, successively unite into one duct, which is convoluted so as to form all the remainder of the epididymis: the tube then gradually enlarges and is less convoluted, and finally becomes straight; and then takes the name of *vas deferens*, and continues on the back of the testicle and at the inner side of the epididymis to the spermatic cord.

The *vas deferens* is a very firm tube about one line, or one tenth of an inch in diameter, the cavity of which is so small, that it will only admit a fine bristle. It passes upwards in the posterior part of the spermatic cord, and continues with it through the abdominal ring: Soon after this it leaves the cord and dips down into the cavity of the pelvis, forming a curve on the side of the bladder, and proceeding backwards, and inwards. On the lower part of the bladder the two *vassa deferentia* approach each other so gradually, that they appear to be nearly parallel. They finally terminate almost in contact with each other in the back part of the prostate gland, where they perforate the urethra, on each side of a tubercle, called *caput gallinaginis*.

2. *Vesiculæ seminales*. These are two bodies of a whitish color, and irregular form, being broad and flat at their posterior extremities, and terminating in a point at the other. Their surfaces are convoluted or rolled together. They are situated between the rectum and bladder, and are connected to each other by a cellular membrane. The convoluted tube composing the *vesiculæ seminales*, terminates in a very short duct, which is nearly of the same diameter with the *vas deferens*, to which it is joined so as to form an acute angle.

The use of this organ is not as some suppose to contain semen, but to secrete a peculiar mucous subservient to the purpose of generation.

3. *Prostate gland*. This is situated on the under and posterior part of the neck of the bladder, so as to surround the urethra. Its form has some resemblance to that of a chesnut, but is larger, and has a notch in the broad end like that of the figure of the heart on playing

cards. This gland secretes a whitish fluid, the use of which is not yet known.

4. *Penis.* This is the cylindrical part that hangs down, before the scrotum in males. It is divided by anatomists into the root, body, and *head or glans penis*. It is composed as follows.

Corpora cavernosa. This composes the body of the penis: they are two irregular cylinders, that are formed by a thick dense elastic membrane, of a whitish ligamentous appearance, and great firmness. They are filled with a substance of cellular structure, which is occasionally distended with blood. The roots of these bodies, which are attached to bone XXVI, (ischium,) and bone XXVII, (os pubis) are small and pointed at the commencement, and are united to the periostum of the bones.

Each of these cylinders is penetrated by the main branch of the pudic artery, which is about equal in size to a hen's quill. These arteries enter the *corpora cavernosa* near their union, and continue through their whole extent, sending off branches in their course; the turgescence or swelling, and erection of the penis is produced by the blood which flows through these vessels into the penis.

Urethra. This is a membranous canal which extends from the neck of the bladder to the orifice at the extremity of the penis; and for a very great part of its length is invested by a spongy structure, called the *corpus spongiosum urethræ*. This latter part begins at the distance of eight or ten lines from the prostate gland, it is much larger at its commencement than at any other part except the glans, and this enlarged part is called the *bulb*, which is oblong, and rather oval in

form; it is marked by a longitudinal depression in the middle, which is very superficial. It consists entirely of a spongy substance.

Glans penis. This is also composed of a spongy substance, but the coat which covers it is more thin & delicate than that of the other parts of the urethra. The lower surface of the glans is filled to the extremities of the *corpora cavernosa*, and projects over them on the upper and side parts of the surface of the penis, the edges of which is called *corona glands*.

Integuments of the penis. The glans penis is covered by a continuation of the skin, which appears altered in its texture so as to resemble in some respects the skin of the lips, and in like manner, is covered by a delicate production of cuticle.

Around the corona of the glans, especially on its upper part, there are whitish tubercles, which are of different sizes in different persons. The skin adheres firmly to the whole extent of the *corona* of the glans, and is very delicate in its structure, as it continues from the glans upon the body of the penis; but it gradually changes so as to assume the appearance and structure of a common skin, and continues in this state over the penis. The skin is of much greater length than the penis, and in consequence of its adhering firmly around the *corona glandis*, it necessarily forms a circular fold or plait, which varies in size according to the length of the skin. This duplicature or fold of the skin, where it takes place so as to cover the glans of the penis, is called *prepuce*, the cutting off of which constituted circumcision under the jewish dispensation.

10. *Of the Female Organs of Generation.*

The female organs of generation consist of the *uterus* and *ovaries* with their appendages; and of the *vagina* with the structure which surrounds its external orifice. The uterus is situated in the pelvis, between the bladder and rectum; and the ovaries are on each side of it. The vagina is a very large membranous canal, which passes from the uterus downwards and forwards, also between the bladder and rectum, and opens externally.

Connected with the orifice of the vagina are several bodies, which are called the *external parts of generation*.

The urinary bladder lies above, and in contact with the vagina; the urethra is also intimately connected with it. As a full description of those parts does not suit in a book designed for family use, I shall conclude this part with the short description already given.



SYSTEM OF ANATOMY:

PART SEVENTH.



OF THE BLOOD VESSELS.

THE blood vessels are flexible tubes, of a peculiar texture, through which blood passes from the heart to the different parts of the body, and returns again from these parts to the heart. They are to be found, in various sizes, in almost every part of the human body. Those which carry the blood from the heart, are more substantial, and elastic than those which return the blood to the heart. Those which carry the blood from the heart are called *arteries*, and those that return the blood are called *veins*. The veins are less substantial and less elastic than arteries.

There are two great arteries, from which all the other arterial vessels of the body are derived. These two arteries are compared to the trunks of trees, and the smaller vessels to their branches, one of these great arteries, called the *aorta* carries the blood to every part of the body. The other called the *pulmonary artery*, carries blood exclusively to the lungs.

The veins which correspond to the branches of the *aorta*, unite with each other, so as to form two great trunks that proceed to the heart. One of these trunks coming from the superior parts of the body, is called the *superior, or descending vena cava*. The other, which comes from the lower parts of the body, is called the *inferior, or ascending vena cava*.

The veins which correspond with the branches of.

the *pulmonary artery*, and return the blood from the lungs to the heart, are four in number: two of them proceed from each lung, and are called *pulmonary veins*.

In many of the veins there are valves which prevent the blood they contain from moving towards the surface and extremities of the body, but allow it to pass towards the heart without impediment.

From the construction of the cavities of the heart, and the position of the valves which are in them; as well as in the situation of the valves at the commencement of the great arteries, and the above mentioned valves of the veins, it is evident, that when the blood circulates, it must move from the heart, through the aorta, and its branches, to the different parts of the body, and return from those parts through the *venæ cavæ*, to the heart: that, when deposited in the heart by the *venæ cavæ*, it must proceed through the pulmonary artery to the lungs, and return from the lungs through the pulmonary veins to the heart, in order to pass again from that organ into the aorta.

It is also certain, that the blood is forced from the heart into the arteries, by the contraction of the muscular fibres of which the heart is composed; and that the blood vessels likewise perform part of the circulation, they propelling the blood which is thus thrown into them; the action of which appears to depend upon causes of a complex nature.

The arteries are composed of coats or tunics, which are very elastic and strong, and which are also very thick. In consequence of the firmness of their coats, they continue open, after their contents are discharged, like hard tubes. They submit to great dilation, and elongation, when fluids are forced into them, and

return to their former dimensions when the distending cause is withdrawn. This elasticity answers a very important purpose in the circulation of the blood. It admits the artery to distend readily, and receives the blood which is thrown into it by the contraction of the heart. It also produces the contraction of the artery: which takes place as soon as the action of the heart ceases; and this contraction of the aorta necessarily forces the blood forward, as the valves at its orifice prevent it from returning to the heart.

The motion of the artery, which is so easily perceived by the touch, and in many instances also by the eye, is completely explained by the discharge of blood into the artery from the heart, and by the elasticity of the vessel, by which it re-acts upon the blood. In some cases it is not simply the diameter of the artery which is enlarged, but a portion of the vessel is elongated; and this elongation, by producing a curvature of it, renders its motion more visible.

Elasticity, in the aorta, and its large branches, seems to be the principal cause of the continuance of the motion which is originally given to the blood by the heart. But there are many circumstances connected with the smaller vessels, which evince that they exert a power which is different from that of elasticity. Thus the application of local stimulants, and of heat, is followed by an increase of motion, in the arteries of the parts to which they are applied. Neither of these causes could produce this effect by the influence of elasticity; but the effect of these and other similar causes is uniformly produced; and a power of independent motion, or *irritability*, is thus proved to exist in these vessels, and seems essentially necessary to the circulation of the blood.

The arteries are composed of a dense elastic substance, of a whitish colour. Their external surface is rough, and intimately connected with the cellular membrane, which every where surrounds it in varying quantities. Internally, they are lined with a thin membrane, which is very smooth and flexible, and is also very elastic. The substance which composes the artery, and is situated between the cellular investment and the internal membrane, consists of fibres, which are nearly, though not completely circular, but so arranged as to constitute a cylinder. The fibres which compose this lamina appear to be united to each other in a way which readily allows of their separation, at the same time forming a firm texture. Although arteries appear widely different in their hardness, and their elasticity, as well as their general texture, they are considered, by a great many, as partaking more or less of muscular structure. It appears that the arteries have a power of contraction different from that which depends upon elasticity: but whether this depends upon muscular fibres superadded to them, or upon an irritable quality in the elastic fibres of blood vessels, is a question which as yet is not decided.

The motion of the blood in the arteries appears to depend,

1st, Upon the impulse given to it by the action of the heart.

2dly, Upon the elasticity of the arteries, in consequence of which they first give way to the blood impelled into them, and then re-act upon it; and

3dly, Upon the power of contraction in the arteries, or their irritability.

In the large arteries the blood seems to move as it would through an inanimate elastic tube, in conse-

quence of the impulse given by the heart, and kept up by the arteries themselves. In the smaller vessels it seems probable, that the motion of the blood depends in a considerable degree upon the contraction which arises from their irritability.

The obvious effect of the elasticity of the arteries is to resist distention and elongation, and to contract the artery to its natural state, when the distending or elongating cause ceases to act. But it must also resist the contraction induced by the muscular fibres, and restore the artery to its natural size when the muscular fibres cease to act after contracting it. It seems probable that all the fibres of which the artery consists are nearly but not completely circular.

The internal coat of these vessels is very smooth, but extremely dense and firm; and seems to be rendered moist and flexible by an exudation on its surface. It adheres very closely to the contiguous fibres of the coat exterior to it, but may be very readily peeled off from them. It is of a whitish colour, and, like the fibrous structure of the artery is very elastic. Like that substance also it is easily torn or broken, and when ligatures have been applied to arteries, it has often been observed that the fibrous structure, and the internal coat have been separated, while this external cellular coat has remained entire.

The arteries are supplied with their proper blood vessels and lymphatics. It is to be observed, that the blood vessels are not derived from the artery on which they run, but from the contiguous vessels. These vessels have nerves also, which are rather small in size, when compared with those which go to the other parts.

The course of the arteries throughout the body is

obviously calculated to prevent their exposure to pressure, or to great extension from the flexure of the articulations by which they pass. With this view they sometimes proceed in a winding direction; and when they pass over parts which are subject to great distention or enlargement, as the cheeks, they often meander; and, therefore, their length may be increased by straightening, without stretching them.

In the trunk of the body the branches of arteries generally form obtuse angles with the trunks from which they proceed. In the limbs these angles are acute.

The communication of arteries with each other is termed *anastomosis*. In some instances, two branches which proceed in a course nearly similar, unite with an acute angle, and form one common trunk.—Sometimes a transverse branch runs from one to the other so as to form a right angle with each. In other cases, the two anastomosing branches form an arch, or portion of a circle, from which many branches go off.

By successive ramifications, arteries gradually diminish in size, until they are finally extremely small. The small arteries do not carry red blood, their diameters being smaller than those of the red particles of that fluid, the serous or aqueous part of the blood can, therefore, only pass through them.

Many of the arteries which carry red blood, and of the last mentioned serous arteries terminate in veins, which are in some respects, a continuation of the tube reflected backwards. They likewise terminate in exhalent vessels upon the external surface, and upon the various internal surfaces of the body. The secretory vessels of glands are likewise the termination of many arteries.

The veins, which return to the heart the blood carried from it by the arteries are more numerous than the arteries, and often larger in diameter. They generally accompany the arteries, and very often two veins are found with one artery.

In addition to these last mentioned veins, which may be called *deep-seated*, there are many subcutaneous veins, which appear on almost every part of the surface of the body.

The capacity of all the veins is therefore much greater than that of all the arteries.

The subcutaneous veins, which are of considerable size, communicate very freely with each other, and also with the *deep-seated veins*.

The trunks of the veins, in those places where no branches go off are generally cylindrical. There are, however, some exceptions, in which these vessels are irregularly dilated, as sometimes happens in the case of the internal jugular vein.

Veins, directly or indirectly, originate from the termination of arteries; but they do not pulsate as the arteries do, because the impulse given to the blood by the heart, is very much diminished in consequence of the great diminution of the size of the vessels through which the blood has passed.

In some cases, however, when blood flows from an open vein; the extent of its projection is alternately increased and diminished, in quick succession, as if it were influenced by the pulsation of the heart.

The coats of the veins differ considerably from those of arteries,—for they are thinner, and so much less firm, that veins, unlike arteries, collapse when they are empty. They consist of a dense elastic substance, the fibres of which are less distinct than those of arteries,

but some of them are to be seen in longitudinal directions. These fibres can be made to contract by local irritation; for if a vein be laid bare in a living animal, and then punctured, it will often contract so as to diminish its diameter, although no blood shall have escaped from the punctures.

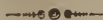
Next to the elastic substance, is the internal coat, which is smooth and polished. It is with difficulty that it is separated from the substance exterior to it, although it may be taken from it very easily in the *vena cava*. This internal coat is frequently so arranged as to form valves, which are plaits or folds of a semilunar form, that project from the surface into the cavities of these vessels. Two of these valves are generally placed opposite to each other; and, when raised up, they form a septum in the cylindrical cavity of the vessel. The septum, thus composed, is concave towards the heart.

The valves have a great effect in preventing the contents of the veins from moving in a wrong direction: they therefore, necessarily modify the effects of lateral pressure, in such a manner, that it propels the blood forward, or to the heart.

These valves are generally formed in the veins of the muscular parts of the body, especially in those of the extremities. They are not found in those veins which are in the cavities of the body, nor in the internal jugulars they are placed at an equal distance from each other.

The coats of the veins are somewhat transparent; in consequence of which, those veins near the skin have a bluish aspect, which is derived from the colour of the blood they contain. The colour of the blood in the veins is different from that in the arteries, being of a darker red.

The situation and arrangement of the large trunks of the veins is much alike in different subjects; but the branches, especially those which are subcutaneous, or near the skin, are very variable in their situations.



OF THE AORTA,

Or the Great Trunk of the Arterial System.

When the heart is in its natural situation, the right ventricle is nearly anterior to the left, and, therefore, the *aorta*, where it originates from the left ventricle, is behind the pulmonary artery, and covered by it. Its first direction is so oblique towards the right side of the body, that it crosses the pulmonary artery behind, and appears on the right side of it. It has scarcely assumed this position before its course alters, for it then proceeds obliquely backwards, and to the left, so as to form a large curve or arch, which extends to the left of the spine. The position of this curve or arch is so oblique, with respect to the body, that the cord or diameter of it, if it were extended anteriorly and posteriorly, would strike the cartilage of the second or third right rib about the middle of its length, and the left rib near the head. In consequence of this position of the curve, the aorta crosses over the right branch of the pulmonary artery, and the left branch of the wind pipe; and assumes a situation, in front, and to the left of the third dorsal vertebra; from this situation it proceeds downwards in front, but rather on the left side of the spine, and in contact with that column.

As the aorta proceeds down the spine, it is situated between the two laminæ of the *mediastinum*. It con-

tinues its course along the spine until it arrives at the cartilaginous substance between the fourth and fifth lumbar vertebræ, when it divides into two great branches of equal size, which form an acute angle with each other. These are called the *common or primitive iliac arteries*.

From the aorta in this course are sent off the arteries which are distributed to all the parts of the body for their nourishment and animation, in the following manner, viz:

The aorta as above named forms a curve immediately after leaving the heart, and proceeds in front, and on the left of the spine, to the cartilage between the fourth and fifth lumbar vertebra, where it bifurcates, or divides, and sends off at the heart.

- | | | |
|------|--|--|
| I. | The two coronary arteries, | { Which are spent upon the heart at the curvature. |
| II. | The common trunk of the right subclavian & right common carotid. | { The carotides are appropriated to the head. They proceed on the side of the trachea and divide at the upper edge of the thyroid cartilage. |
| III. | The left common carotid. | |
| IV. | The left subclavian. | { Each of the subclavians is the first portion of the great artery of the upper extremities of its respective sides. |

The external carotid which is appropriated to the exterior of the head, and the upper parts of the neck, gives off,

- | | | |
|----|------------------------------|--|
| 1. | The superior thyroid artery. | { To the thyroid gland, the larynx & the parts contiguous to the <i>os hyoides</i> . |
| 2. | The sublingual. | { To the sublingual gland, and the pharynx. |

- | | |
|-----------------------------|--|
| 3. The facial. | { To the sides of the face,
chin, lips, and parts under the lower jaw. |
| 4. The inferior pharyngeal. | { The pharynx and contiguous parts. The cavity of the cranium. |
| 5. The occipital. | { To the back part of the cranium externally. |
| 6. The posterior Auricular. | { To the cavity of the ear, and parts contiguous to the external ear. |
| 7. The internal maxillary. | { To the upper & lower jaw bones,—the fauces,—the pterygoid muscles,—the palate,—the dura mater,—& the interior of the nose. |
| 8. The temporal. | { To the front and side side parts of the cranium, externally. |

The *internal carotid*, which is appropriated to the interior of the cranium, sends off,

- | | |
|--------------------------------------|---|
| 1. The ophthalmic. | { To the eye and its appendages. |
| 2. The anterior artery of the brain. | { To the anterior portion of the cerebrum. |
| 3. The middle artery of the brain. | { To the middle and back portion of the cerebrum. |

The *left subclavian* gives off,

- | | |
|----------------------------|---|
| 1. The internal mamillary. | { To the anterior portions of the thorax mammæ, &c. |
|----------------------------|---|

- | | |
|------------------------------|--|
| 2. The vertebral. | { To the cerebellum, and the posterior portion of it. |
| 3. The inferior thyroid. | { To the thyroid gland, trachea, œsophagus, &c. |
| 4. The superior intercostal. | { To some of the intercostal spaces. |
| 5. The cervicle. | { To the muscles, glands, nerves, &c. on the neck. |
| 6. The scapulary. | { To the muscles on the neck, and dorsum of the scapula. |

The axillary, is the next portion of the artery of the upper extremities. It gives off,

- | | |
|---|---|
| 1. The thoracic and the external mamary arteries. | { To the pectoral and other muscles on the anterior part of the thorax and shoulders. |
| 2. The scapulary artery. | { To the muscles about the scapula, & the posterior part of the thorax. |
| 3. The circumflexæ. | { To the parts about the upper end of the os humeri, or bone of the arm. |

The humeral. This is the third portion. It gives off,

- | | |
|---------------------------|--|
| 1. The profunda humeri. | { to the muscles of the os humeri, or bone of the arm. |
| 2. The profunda inferior. | |
| 3. The anastomotica. | { to join with an artery from below, and to the muscles. |

At the Elbow it gives off,

1. The radial. {
 - Branches to the muscles in its course.
 - A recurrent branch.
 - A branch to the thumb.
 - to the radial side of the index.
 - to the arcus profundus.
2. The interosseal. {
 - to the muscles on the fore arm.
 - to the wrist and hand.
 - A recurrent branch.
3. The ulna. {
 - Branches to the muscles in its course.
 - to the arcus sublimus in the palm of the hand, which sends off the arteries to the fingers.

The aorta gives off between the curvature and the great bifurcation or division.

- V. The bronchial arteries. {
 - to the trachea and substance of the lungs.
- VI. The œsophagal.....To the œsophagus.
- VII. The inferior intercostal. {
 - to nine of the ten lower intercostal spaces.
- VIII. The phrenic arteries.....To the diaphragm.
- IX. The cœliac artery. {
 - To the stomach, liver and spleen.
- X. The superior messenterie. {
 - Almost all the small intestines, & part of the great.
- XI. Capsular arteries.....To the glandulæ renales.
- XII. The emulgents.....to the kidneys.
- XIII. The spermatics.....to the testicles, ovaries &c
- XIV. The inferior messenteries. {
 - to the left portion of the colon, and the rectum.

- XV. The lumbar arteries. { To the muscles on the loins
and the abdomen, the
spine & spinal cavity.
- XVI. The middle sacral. { To the coccyges, sacrum,
and rectum.

At the great bifurcation.

XVII. *The primitive iliacs*, one of which is divided on each side of the pelvis, and are called *internal* and *external iliacs*. *The internal iliac* sends off,

1. The ilio lumbar artery. { To the psoas, and iliacus
internus muscles.
2. Sacro lateral. { To the sacrum, internally
and externally, and to
the *cauda equina*, or bun-
dle of nerves at the low-
er end of the spinal mar-
row.
3. Umbilical. { To the bladder, uterus,
and rectum.
4. Obturator. { To the muscles on the up-
per and interior of the
thigh, the hip joint, &c.
5. Gluteal. { To the muscles on the lat-
eral & posterior parts of
the ossa innominata.
6. Ischiatic. { To the muscles, &c. on the
upper and back part of
the thigh.
7. Internal pudic, To the organs of generation

The external iliac, is the first position of the great artery of the lower extremities, which passes under Paupart's ligament to the thigh; but previously sends off,

1. The circumflexa ilii. { A small artery, which is spent upon the iliacus internus muscles, and the contiguous portions of the abdominal muscles.
2. The epigastric. { Which is spent upon the muscles, and integuments of the anterior part of the abdomen.

The femoral artery. This is the second portion of the great artery of the lower extremity. It commences at Paupart's ligament, and sends off,

1. The external pudic. { To the exterior parts of the organs of generation.
2. The profunda. { To the two circumflexæ muscles, and to the muscles on the thigh.

The popliteal. Is the third portion of the great artery, and lies on the back part of the thigh. It sends off the articular arteries which anastomose with each other, and supply the contiguous parts. It divides into,

1. *The anterior tibial*, which proceeds down the anterior part of the leg to the top of the foot, from which it descends to the sole. It sends off, { A recurrent branch, to anastomose with branch from above.
Branches to the anterior muscles of the leg.
tarsal & metatarsal branches to the upper part of the foot.
2. *The peroneal*. This is near the fibula on the posterior side of the interosseal ligament, and is spent upon { The muscles on the outside of the leg.
The ankle and outside of the foot.

3. *The posterior tibial.* This { Branches to the muscles.
 passes down behind the tibia { The medullary of the tibia.
 and the internal ankle to the { The internal and external
 sole of the foot, where it di- { planter arteries, to the
 vides, and sends off { parts on the sole of the
 foot and the toes.

It is deemed unnecessary to enter into a particular description of all the arteries and veins, as plate IV. will shew at one view, the situation of some of the most important blood vessels.



EXPLANATION OF PLATE IV.

This plate represents the heart, large arteries, and veins, with some of the muscles, &c.

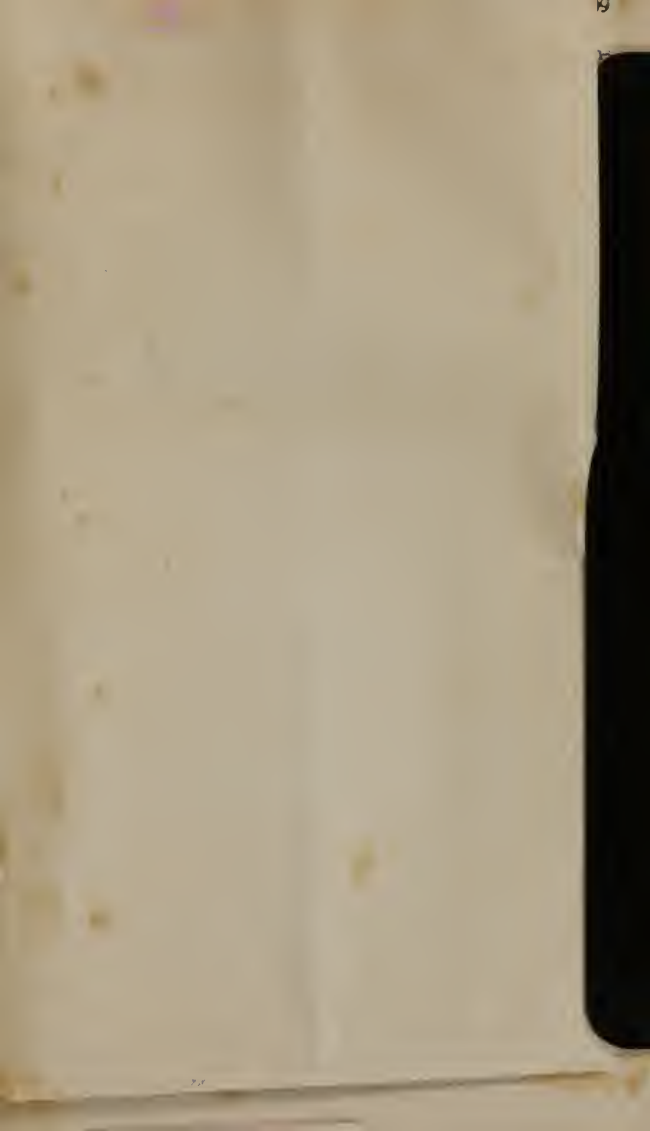
Superior Extremity.

- a Muscle 36.
- b Muscle 112.
- c Muscle 41.
- d Os hyoides (bone vi.)
- e Thyroid gland.
- f Muscle 144.
- g Muscle 102.
- hh The clavicle cut.
- i Muscle 129.
- k Muscle 122, cut at its extremity.
- l Muscle 130.
- m Muscle 134.
- n The heads of muscles 144, 145, & 151.
- o Muscle 142 cut at its extremity.
- p Muscle 152.
- q Muscle 136, cut at its extremity.
- r Transverse ligament of the wrist.
- s Muscles 137 & 138.
- t Muscle 103.

- u The anterior edge of muscle 94.
- vv Inferior part of the diaphragm.
- ww Its anterior edge cut.
- xx Kidnies.
- y Muscle 72.
- z Os ilium.

Inferior Extremities.

- a Muscle 89.
- b Muscle 90.
- c The fleshy origin of muscle 176.
- dd Bones xvii, cut from each other.
- e Muscle 176, cut from its origin.
- f Short head of muscle 168 cut.
- g Great head of the same muscle.
- h Long head cut.
- i Muscle 180.
- k Muscle 179.



ANATOMY



- l* Muscle 181.
m Muscle 186.
n Muscle 187.
o Tibia (bone xxxix)
p Muscle 191.
q Muscle 192.
r Fibula (bone xl)

Heart and blood vessels.

- A Heart, coronary arteries and veins.
 B Right auricle of the heart.
 C Aorta ascendens.
 D Left subclavian artery.
 E Left carotid artery.
 F The common trunk which sends off the right subclavian and right carotid arteries.
 G External carotid.
 H Facial artery, which sends off the coronary artery to the lips.
 I The temporal artery.
 K Aorta descendens.
 LL Iliac arteries.
 MM Femoral, or crural arteries.
 N. B. The other arteries of this figure have the same distribution as the veins of the same name.
 1 The frontal vein.
 2 " facial vein,

- 3 Vena temporalis profunda.
 4 Vena occipitalis.
 5 External jugular vein.
 6 Internal jugular vein.
 7 The vascular arch on the palm of the hand.
 8 " Radial artery, & vein.
 9 " Ulnar artery, & vein.
 10 10 Cephalic vein.
 11 Basilic vein.
 12 Median vein.
 13 Humeral vein.
 14 14 External mammary arteries and veins.
 15 Axillary vein covering the artery.
 16 16 The subclavian veins.
 17 " vena cava superior
 18 " cutaneous arch of veins on the fore part of the foot.
 19 " Front tibial vein covering the artery.
 20 " Femoral vein (profunda).
 21 " Upper part of the vena saphena major.
 22 " Femoral vein.
 23 23 " Iliac veins.
 24 24 " Inferior vena cava
 25 25 " Renal veins covering the arteries.
 26 26 " Diaphragmatic veins.

SYSTEM OF ANATOMY;

PART EIGHTH.



OF THE BRAIN, SPINAL MARROW, AND NERVES.

THE whole of the soft mass which fills the cranium. is called the brain. This mass is covered with three membranes, which are denominated *dura mater*, *tunica archnoidea*, and *pia mater*.

The *dura mater* encloses the brain and its appendages, and lines the different parts of the cranium. It consists of one membrane of a very dense texture, which in several places is composed of two or more laminæ. It is the thickest and strongest membrane of the body, and is composed of tendinous fibres, which have a shining appearance, particularly on its inner surface.

The *dura mater* adhere every where to the surface of the cranium, in the same manner as the periosteum adheres to the bones in the other parts of the body.

The inner surface of the *dura mater*, which is very smooth, is in close contact with the brain, but adheres only where the veins go into the sinuses; & is lubricated by a fluid discharged through its vessels, which guards the brain from danger.

The *dura mater* serves as a defence to the brain, and supplies the place of a periosteum to the inside of the cranium; giving nourishment to it.

The *tunica archnoidea* is a very thin, tender, and

transparent membrane, which is spread uniformly over the surface of the brain, enclosing all its convolutions, without insinuating itself between any of them.

The *pia mater* is somewhat of the nature of the former covering, but is very vascular. It covers the brain in general,—enters double between all its convolutions, and lines all the different cavities called ventricles.

The *pia mater* serves to conduct and support the vessels of the brain, and allows them to divide into such minute parts, as to prevent the blood from entering the tender substance of this viscus with too great force.

The brain is composed of four portions, viz. *cerebrum*, *cerebellum*, *tuber annulare*, or *pons varolii*, and *medulla oblongata*.

The *cerebrum* completely fills the upper part of the cavity of the cranium. It has some resemblance to half an egg, which has been divided horizontally; and is composed of two equal parts, which are separated vertically from each other by the *falx* or process of the *dura mater*, which resembles a sythe with the edge turned down. This vertical separation does not extend through the centre of the *cerebrum*, although it divides it completely before and behind.

The upper surface of the two hemispheres is convex. The under surface is rather irregular. Each hemisphere is divided into three lobes: the *anterior*, the *middle*, and the *posterior*.

The *anterior lobes* of the brain are situated on the front part of the base of the cranium, principally on the orbitor process of bone I (*os frontis*.)

The *middle lobes* are lodged in the *fossæ* or depressions formed by the temporal and sphenoid bones.

The *posterior lobes* rest chiefly upon the *tentorium*, or [process of the *dura mater*, which separates the cerebrum from the cerebellum.

The *cerebellum* is situated in the lower and posterior part of the cavity of the cranium, in contact with a portion of bone IV, (*os occipitis*.) It is of course much less than the upper portion of the brain.

It is covered by the *tentorium*, and is divided below into two lobes, by a process of the *dura mater* called *falx minor*.

On the basis of the brain is a part called *tuber annulare*, or *pons varolii*, which is formed by processes from the cerebrum and cerebellum; and is in contact with the anterior and inferior portion of the cerebellum in the middle. From this part the *medulla oblongata* proceeds downwards and backwards, under the cerebellum; and between the cerebellum, the medulla oblongata, and the *pons varolii*, is the vacuity, called the fourth ventricle of the brain.

The *medulla oblongata* is continued from the cavity of the cranium, through the great cavity of bone IV. (*os occipitis*) into the great canal of the spine; when it takes the name of *medulla spinalis* or spinal marrow.

The *dura mater* passes with it through the great foramen, and encloses the whole of it. At the commencement of the spinal canal, this membrane is attached to the surrounding bones, viz. to the margin of the great occipital foramen, and to the upper vertebra of the neck; but below this it is loosely connected by a membrane which sometimes appears to contain a little adeps. The *tunica archnoidea* and the *pia mater*, also invests the spinal marrow.

The spinal marrow consists of medullary mater externally, and cineritious or cortical mater internally.

The spinal marrow terminates in a point near the uppermost lumbar vertebra. The *ligamenta denticulata* of the opposite sides join each other at this point, and form a small cord, which continuing downwards, is inserted into the os coccygis. These ligaments support, and keep fixed, the medulla and the nerves, as they originate from it.

The brain and spinal marrow gives origin to all the nerves belonging to the human system; hence they are distinguished into cerebral, and spinal nerves. The cerebral nerves are nine in number; and those of the spine thirty; these are distributed to the different parts of the human system that is endowed with sensibility.

Nerves are long white medullary cords, which are very sensitive.

The following plate shows the regular nerves.

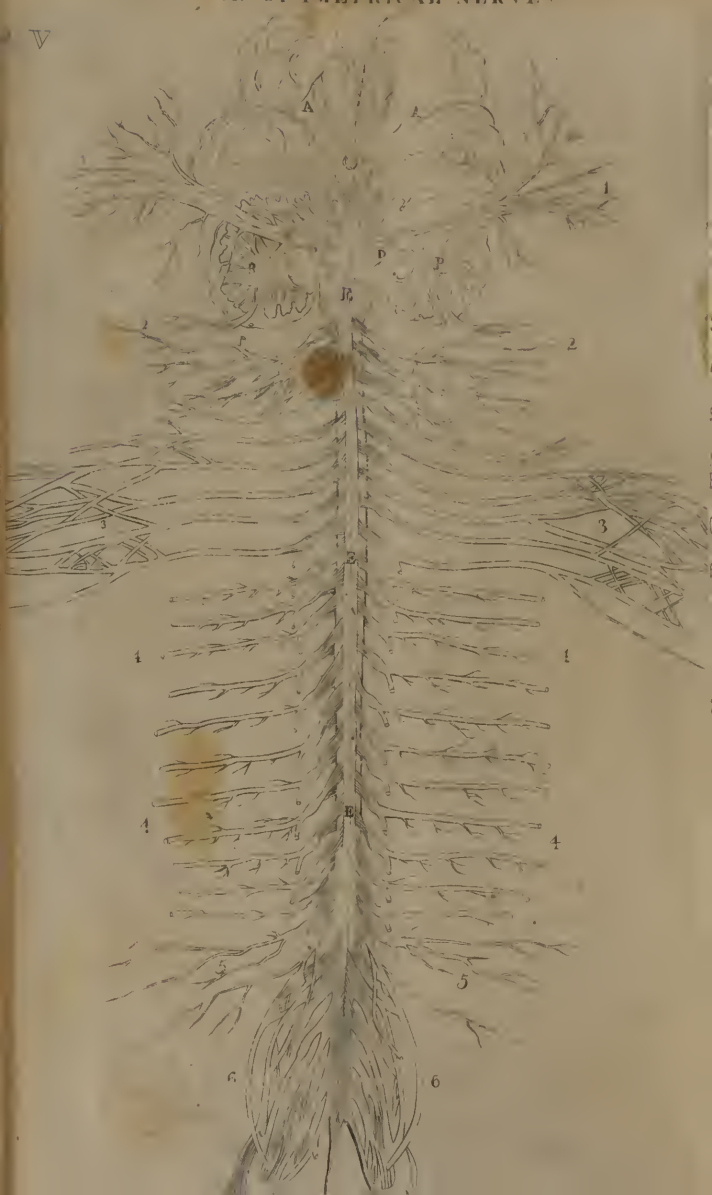


EXPLANATION OF PLATE V.

- | | | | |
|------|--|-------------|---|
| A | The cerebrum. | | capital, which have double origins. |
| B | The cerebellum. | | |
| CC | The crura cerebri. | 3, 3 | Branches of the four cervical nerves and of the first dorsal. |
| DD | The crura cerebelli. | 4, 4, 4, 4, | Branches of the dorsal nerves. |
| EEE | The spinal marrow. | 5, 5 | Branches of the lumbar nerves. |
| 1, 1 | Branches of the fifth pair, arising from the union of the crura cerebri & crura cerebelli. | 6, 6 | The sacral nerves. |
| 2, 2 | Branches of the sub-oc- | | |

701

V



A TABLE OF NERVES.

Cerebral Nerves.

1. The first pair, called olfactory.
2. The second pair called optic nerves.
3. The third pair, or oculorum motores.
4. The fourth pair, or pathetici.
5. The fifth pair, or trigemini, which gives off
 - A The ophthalmic, or orbital.
 - B " superior maxillary nerve.
 - C " inferior maxillary nerve.
6. The sixth pair, or abducentes, which sends off a branch to unite with one from the fifth, forming the great intercostal nerve.
7. The seventh pair, or auditory nerves.
8. The eighth pair, or par

vagus, arising from the medulla oblongata. The par vagum gives off

- A The right and left recurrent nerves.
- B The several branches in the chest, to form the cardiac plexus.
- C Several branches to form the pulmonic plexus.
- D Several branches to form œsophageal plexus.
- E It then forms in the abdomen the stomachic plexus.
- F The hepatic plexus.
- G The splenic plexus.
- H The renal plexus, receiving several branches from the great intercostal, which assists in their formation.
9. The ninth pair, or lingual nerves, which go from the medulla oblongata.

SPINAL NERVES.

Those nerves are called *spinal*, which pass out through the lateral or intervertebral foramina of the spine. They are divided into *cervical*, *dorsal*, *lumbar*, and *sacral nerves*.

Cervical Nerves.

The *cervical nerves* are eight pair, viz:

The *first* are called the *occipital*; they arise from the beginning of the spinal marrow, pass out between the margin of the occipital foramen, and upper vertebra of the neck, and are distributed about the occiput and neck.

The *second* pair of cervical nerves send a branch to the accessory nerve, and then proceed to the parotid gland and external ear.

The *third* cervical pair, supply the integuments of the shoulder blade, and muscles near about that place, and send a branch to form, with others, the diaphragmatic nerve.

The *fourth*, *fifth*, *sixth*, *seventh*, and *eighth* pair, all converge to form the *brachial plexus*, from which arises the six following.

1. The *axillary nerve*, which sometimes arises from the radial nerve. It runs backwards and outwards around the neck of the os humeri, or bone of the arm, and ramifies the muscles of the shoulder blade.

2. The *external cutaneal*, which perforates muscle 130, to the bend of the arm, where it accompaies the medium vein as far as the thumb, and is lost in its integuments.

3. The *internal cutaneal*, which descends on the in-

side of the arm, where it bifurcates, or divides, from the bend of the arm, the anterior branch accompanies the basilic vein, to be inserted into the skin of the palm of the hand; the posterior branch runs down the internal part of the fore arm, to be lost in the skin of the little finger.

4. The *median nerve*, which accompanies the brachial artery to the fore arm, passes under the annular ligament of the wrist, and goes on to the palm of the hand, and then supplies the digital nerves, which go to the extremities of the thumb, fore and middle fingers.

5. The *ulnar nerve*, which descends between the brachial artery and basilic vein, between the internal condyle of the humerus or bone of the arm; and the olecranon, and divides in the forearm into an internal and external branch. The internal branch passes under the ligament of the wrist, and scaphoid bone, to the hand, where it divides into three branches, two of which go to the ring and little fingers, and the third forms an arch towards the thumb, in the palm of the hand, and is lost in the contiguous muscles. The external branch passes over the tendon of muscle 141, and back of the hand, to supply the two last fingers.

6. The *radial nerve*, which sometimes gives off the axillary nerve. It passes backwards, about the humerus or bone of the arm, descends on the outside of the arm, along the side of muscle 133 to the fore arm. At the upper extremity of the *radius* or bone of the fore arm, it divides into two branches; one goes along the radius to the back of the hand, and terminates in the interosseous muscle, the thumb, and the first three fingers; the other is lost in the muscles of the fore arm.

Dorsal Nerves.

The *dorsal nerves* are twelve pairs in number. The first pair gives off a branch to the *brachial plexus*. All the dorsal nerves are distributed to the muscles of the back, the intercostals, the abdominal muscles, and the diaphragm. The five inferior pairs go to the cartilages of the ribs, and are called *costal*.

Lumbar Nerves.

The five pairs of *lumbar nerves* are bestowed about the loins and muscles, skin of the abdomen and loins, scrotum, ovaria, and diaphragm. The second, third, and fifth pairs unite, and form the *obturator nerve*, which descends over muscle 89 into the pelvis, and passes through the *foramen thyroïdeum* to the obturator muscle, triceps, pectineus, &c.

The third and fourth, with some branches of the second pair, from the *crural nerve*, which passes under *Paupart's ligament* with the femoral artery, sends off branches to the adjacent parts, and descends in a direction to the internal condyle of the thigh bone, from whence it accompanies the *saphena vein*, to the internal angle, to be lost in the skin of the great toe. The fifth pair is joined to the first pair of the sacral nerves.

Sacral Nerves.

There are five pairs of the *sacral nerves*, all of which arise from the *cauda equina*, or termination of the spinal marrow. The first four pair give off branches to the pelvic viscera, and are afterwards united to the last lumbar, to form a large plexus which gives off,

The *ischiatric nerve*, the largest in the body. The ischiatic nerve, immediately at its origin, sends off branches to the bladder, rectum, and parts of generation; proceeds from the cavity of the pelvis through the ischiatic notch, between the tuberosity of the ischium, and great trochanter, to the ham, where it is called the *popliteal nerve*. In the ham it divides into two branches, which descend and are distributed through the different parts of the foot and toes.

The nervous system consists of the medullary substance of the *brain, cerebellum, medulla, oblongata, and spinalis*, and of the same substance continued into the nerves by which it is distributed to many different parts of the body. The whole of this system seems to be distinguished into four parts.

1. The medullary substance contained in the cranium and vertebral cavity; the whole of which seems to consist of distinct fibres, but without the smaller fibres being separated from each other by any evident enveloping membranes.

2. Connected with one part or other of this substance, are the nerves, in which the same medullary substance is continued: but here more evidently divided into fibres, each of which are separated from the others, by an enveloping membrane, derived from the pia mater.

3. Parts of the extremities of certain nerves, in which the medullary substance is divested of the enveloping membranes from the pia mater, and so situated as to be exposed to the action of certain external bodies, and perhaps so formed as to be affected by the action of certain bodies only, these are named the *esntient extremities* of the nerves.

4. Certain extremities of the nerves, so framed as to be capable of peculiar contractibility; and, in consequence of their situations and attachments, to be, by their contraction, capable of moving most of the solid and fluid parts of the body. These are named the moving extremities of the nerves.

These several parts of the nervous system are every where the same continuous medullary substance, which is supposed to be the vital solid of animals, so constituted in living animals, as to admit of motions being readily propagated from any one part to every other part of the nervous system, so long as the continuity and natural living state of the medullary substance remains. In the living man there is an immaterial thinking substance, or mind, constantly present, and every phenomenon of thinking is to be considered as an affection or faculty of the mind alone. But this immaterial and thinking part of man is so connected with the material and corporeal part of him, and particularly with the nervous system, that motions excited in this give occasion to thought, and thought however occasioned, gives occasion to new motions in the nervous system. This mutual communication, or influence, is assumed with confidence as a fact; but the mode of it I do not understand, nor pretend to explain.

The phenomena of the nervous system appear commonly in the following order: the impulse of external bodies act upon the *sentient* (see part 3 above) extremities of the nerves; and this gives occasion to perception or thought, which, as first arising in the mind, is termed sensation. This sensation according to its various modifications, gives occasion to volition, or the willing of certain ends to be obtained by the motion

of certain parts of the body; and this volition gives occasion to the contraction of muscular fibres, by which the motion of the part required is produced.

As the impulse of bodies on the sentient extremities of a nerve does not occasion any sensation, unless the nerve between the sentient extremity and the brain be free; and as, in like manner, volition does not produce any contraction of muscles, unless the nerve between the brain and muscle be also free; it is therefore concluded from both these facts, that sensation and volition, so far as they are connected with corporeal motions, are functions of the brain alone; and it is presumed that sensation arises only in consequence of external impulse producing motion in the sentient extremities of the nerves, and of that motion being propagated along the nerves of the brain; and, in like manner, that the will operating in the brain only, by a motion begun, there propagated along the nerves, produces the contraction of muscles. From what is now said, we perceive more distinctly the different functions of the several parts of the nervous system.

1. The sentient extremities seem to be particularly fitted to receive the impression of external bodies; and according to the difference of these impressions, and of the condition of the sentient extremity itself, to propagate along nerves motions of a determined kind, which communicated to the brain give occasion to sensation.

2. The brain seems to be the party fitted for, and susceptible of, those motions with which sensation, and the whole consequent operations of thought, are connected; and thereby is fitted to form a communication between the motions excited in the sentient, and those in consequence arising in the moving extremities of

the nerves, which are often remote and distant from each other.

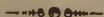
3. The moving extremities are so framed as to be capable of contraction excited by motion propagated from the brain, and communicated to the contractile fibre.

4. The nerves more strictly so called, are to be considered as a collection of medullary fibres, each enveloped in its proper membrane, and thereby, so separated from each other, as hardly to admit of any communication of motion from any one of the others, and to admit only of motion along the continuous medullary substance of the same fibre, from its origin to the extremities, or contrawise.

From this view of the parts of the nervous system, of their several functions and communication with each other, it appears that the beginning of motion in the animal economy is generally connected with sensation; and that the ultimate effects of such motions are chiefly actions depending immediately upon the contraction of moving fibres, between which and the sentient extremities, the communication is by means of the brain.

SYSTEM OF ANATOMY;

PART NINTH.



Of the Absorbents, general integuments, or the cellular membrane, & the skin.

ABSORBENT VESSELS. The absorbent vessels are small transparent tubes, of a delicate structure, which exist in considerable numbers in almost every part of the body.

These tubes originate upon the surface of all the cavities of the body; and of the cellular membrane, in all the various parts into which it penetrates; upon the internal surface of the stomach, and the intestines; and upon the skin.

Those which originate in the lower extremities, and the cavity of the abdomen, unite and form a large trunk, called the *thoracic duct*, which proceeds through the thorax, and terminates in the left *subclavian vein*, at its junction with the *internal jugular*.

Those of the left upper extremity, the left side of the head, and the contiguous parts, form a trunk which terminates in the same place. While the remaining absorbents, or those of the right upper extremity, and the right side of the head, &c. also form a trunk, which terminates in a corresponding part of the right *subclavian vein*.

The absorbent vessels of the middle size, which arise from the union of the small vessels, and unite to form the large, in their progress to these large vessels, pass through certain bodies which have been denomina-

ted *conglobate glands*; and may be considered as appendages of the absorbent system.

The absorbent vessels are composed of two coats, which are thin, but dense and firm, and also elastic. The coats of the thoracic duct may be separated from each other. The internal surface of the outer coat is fibrous. The internal coat, is a delicate, but strong membrane.

Cellular membrane. The cellular membrane is situated between the skin and the muscles, which is insinuated between the different muscles, and between the fibres which compose them; which also connects the different parts of the body to each other.

As it extends over the whole body, and is most intimately connected with the skin, it is considered as one of the integuments, although it is found in great quantities in some of the internal parts.

It appears to be composed of membranous lamina, exquisitely fine and delicate in their structure, which are so connected to each other, that they compose cells or cavities of various forms and sizes.

When these cavities are empty, this arrangement of the cellular membrane is not apparent; but when they are distended by water or air it is very evident.

THE SKIN. The skin is composed of three dissimilar laminae, which are denominated, the *cutis vera*, the *reta mucosum*, and the *cuticula*.

Cutis vera. This is the innermost of the above mentioned lamina, and is much more substantial than the others. It is an elastic dense, and strong membrane, which contains in its texture a large proportion of fibres that appear to be tendinous, and are woven together in an intricate manner.

Blended with these fibres are an innumerable number

of vessels which enter into the texture of the skin. These vessels do not generally convey red blood, and therefore they are not visible; yet they may be readily brought into view, by the application of rubefacients during life. Their existence is also demonstrated in the vigorous infant, at birth, by the universal redness of the skin, which is observable at that time.

The skin thus constructed, extends over the whole of the body, and is continued into those cavities which open upon the surface, as the mouth, nose, &c. although its texture changes immediately upon its reflection.

This is the part which is called the true skin, and when in a healthy state is invariably white. The variety of colors in the human species depends upon the layer next to the cutis, which is now to be described.

Rete mucosum. Immediately in contact with the *cutis vera*, is a thin stratum, of a pulpy or mucilaginous consistence, which appears to be spread uniformly over it, but cannot be detached without deranging its own texture.

It can be best examined after the cuticle is raised in a blister. In this case it appears like a pulpy substance, spread upon a membrane of a soft and delicate texture.

In this pulpy substance resides the *pigmentum*, or colouring matter, which gives the peculiar complexion to the different races of men. The *cutis vera* is white, and the cuticle is nearly transparent in them all; but the rete mucosum is black in the Negro: copper coloured, yellow or tawny, in many of the Asiatics; and yellow, with a tinge of red in the Indians of America; while it is transparent, or whitish, in the people of Europe and their descendants.

The *cuticula* or *epidermis*. This is the exterior layer of the integuments or skin. It appears to have some resemblance to the matter of the nails, & of horn; but is more flexible, even after allowing for the difference of thickness. In those parts where it is the thinnest, it is semi-transparent. It is insensible and no vessels can be traced in it; and extends over the whole surface of the body, except the parts covered by the nails, and is accommodated to the surface of the skin, by forming ridges or furrows corresponding to it.

It adheres closely to the cutis and rete mucosum; and when irritated by mechanical violence, the surface of the skin appears moistened by effusion.

The adhesion of these membranes to each other is as uniform as that of two smooth surfaces glued together; but it is generally said that the cuticle or external membrane is attached to the cutis by very numerous and fine filaments.

It has often been asserted, that these filaments are the exhaling and absorbing vessels, which pass through the cuticle, to and from the skin, which appears very reasonable.

Notwithstanding the uniform adhesion of the cuticle to the cutis, it is observed, in the living subject to be separated, and formed into vesicles by a variety of causes, viz:

1. Pinching the skin, or violent mechanical irritation; such as laboring with hard instruments.
2. By the application of cantharides, and certain other substances, which produce vesications.
3. Boiling heat will generally produce vesication.
4. Certain diseases seem to produce vesication, viz: *crysipelas*, *zoma* or *shingles*, and many other eruptions which have no name.

In severe cases of the *scarlatina*, or scarlet fever, at the termination of the disease, large portions of the cuticle are sometimes detached from the cutis.

In the spring of 1833, I attended on upwards of one hundred cases of the scarlet fever, in the most of which the cuticle was detached from the cutis, and peeled off entirely over the whole system, at the termination of the disease. A young woman of this county, Miss M. E. after recovering from a severe spell of the *scarlatina*, was so speedily deprived of the cuticle, that she was left so tender she could scarcely bear the heat of the sun for several months after her recovery.

There could be a great many other causes mentioned which would produce vesication.

The skin answers a fourfold purpose in the animal economy. It is the organ of touch. It covers and protects the whole structure. It is the outlet of a portion of insensible perspiration, and performs absorption.

The skin appears to have a connection with the lungs and stomach, from the consideration that they, with the liver are generally affected by checked perspiration; and also from the consideration that eruptions of the skin, such as *urticaria*, or nettle rash, have frequently relieved children of the spasmodic croup. In a word, the skin has such a connection with the whole system, that the most of diseases may be traced back to checked perspiration.



GLOSSARY.



- ACCELERATOR*, From *accelero*, to hasten or propel.
- Acetabulum*, From *acetum*, vinegar: the cavity of the os innominatum, so called, because it resembles an ancient cup for holding vinegar.
- Acromion*, A process of the shoulder blade.
- Addetamentum*, An addition to any part.
- Adductor*, To draw or contract.
- Anastomosis*, The communication of vessels with one another.
- Anconeus*, The elbow.
- Anterior*, Before. A term applied to what may be situated before another.
- Antihelix*, The inner circle of the external ear.
- Antitragus*, An eminence of the outer ear.
- Antrum*, A cavity which has a small opening into it.
- Aponeurosis*, A tendinous expansion.
- Articulation*, From *articulus*, a joint.
- Arytænoid*, Applied to parts which are shaped like a funnel.
- Attollens*, to lift up. Applied to muscles, that raise the part to which they are attached.
- BICEPS*, Any thing having two heads,
- Bicuspidatus*, Any thing having two points.
- Bifurcate*, Any thing that divides into two parts, or forks.
- Bronchial*, Appertaining to the wind pipe.
- Bursa*, A bag.
- Bursa mucosa*, A mucous bag, near joints.
- CAROTID*, (From a Greek word meaning to sleep,) an artery of the neck.
- Cauda*, (From *caudo* to fall,) a tail.
- Cauda equina*, A bundle of nerves starting off at the lower end of the spinal marrow, is so called from its resemblance to a horse's tail.
- Cellular*, Having little cells.
- Cerebellum*, (Diminutive of *cerebrum*,) the little brain.
- Cerebrum*, The brain.
- Chondrosyndesmus*, A cartilaginous ligament.
- Coccygis*, A bone resembling a Cuckoo's bill.
- Concha*, A hollow vessel: Applied to the cavity of the ear.
- Condyle*, Applied to round eminences of bones at the joints.
- Constrictor*, to bind together. A name given to muscles.
- Convuluted*, Rolled up or folded.

- Coracoid*, Any thing shaped like the beak of a crow.
Cornea, The sclerotic membrane of the eye is so called, because it is of a horny consistence.
Cornu, A horn.
Coronal, (From *corona*.) A crown or garland.
Corpus, A body.
Corrugator, From *corrugo* to wrinkle.
Costa, The rib of an animal.
Cremaster, To suspend.
Crico, Words compound of this belong to muscles, which are attached to the cricoid cartilage.
Cricoid, Resembling a ring.
Crista, Any thing which has the resemblance of a comb upon the head of a cock.
Crura, The plural of *crus*.
Crus, A leg, or origin.
Cuticle, Diminutive of *cutis*, the skin.
- DEGLUTITION*, From *deglutio*, to swallow down.
Deltoides, A muscle so called, because it is shaped like the Greek letter Delta.
Depressor, From *deprimo*, to press down.
Digastricus, Derived from two Greek words meaning two bellies. A muscle is thus named having two bellies.
Ductus, A canal or duct.
- ENSIFORMIS*, From *ensis* a sword and *forma* resemblance. A term applied to parts resembling a sword.
Epigastric, From two Greek words meaning above the stomach.
Epiglottis, The cartilage at the root of the tongue that falls upon the glottis.
Erector, To raise up, a name given to muscles.
Ethmoid, Any thing perforated like a sieve.
Extensor, To stretch out.
- FORAMEN*, From *foro* to pierce, a small opening.
Fossa, A depression or ditch.
Frontalis, From *frons*, the forehead.
Fungus, Proud flesh. A term in surgery to express any luxuriant formation of flesh on an ulcer.

GANGLION, A knot.

Gastritis, Inflammation of the stomach.

Genoi, From a Greek word meaning the chin.

Glenoid, The name of articulating cavities of bones.

Glossa, From a Greek word meaning the tongue.

Gluteus, The buttocks, a name given to muscles.

HELIX, the external circle or border of the ear.

Hepaticia, the liver.

Hepatitis, Inflammation of the liver.

Hypochondrium, From two Greek words meaning under a cartilage, that part of the body under the cartilages of the short ribs.

Hypogastrium. The lower part of the abdomen.

INTERCOSTAL, From *inter* between and *costa* a rib. A name given to muscles, &c. between the ribs.

Interosseous, From *inter* between and *os* a bone. A name given to muscles, &c. which are between bones.

Ischium, the loin. A bone of the pelvis so named because it is near the loin.

JUGALIS, From *jugum* a yoke; the name of a bone of the head.

LATERALIS, From *latus* the side. Any thing situated on the side.

Latissimus, A term applied to broad muscles.

Laxator, From *laxo* to loosen. A name given to muscles.

Levator, From *levo* to lift up. A name given to muscles.

Linæa, From *linum*, a thread. A thread-like appearance.

Linea Alba, A tendinous expansion, situated in the center of the anterior part of the abdomen.

Longissimus, the longest. Muscles are so named from their length.

MALLEOLUS, Diminutive of *malleus*, a mallet: the ancle.

Maseter, to chew; the name of a muscle.

Mastoid, Processes of bones are so named, when they resemble the nipple of a breast.

Maxilla, to chew. The upper and lower jaws are so called.

Meatus, An opening which leads to a canal or duct.

Mediastinum, A membranous division formed by the pleura dividing the chest into two parts.

Metacarpus, That part of the hand which is between the wrist (*carpus*) and fingers.

Metatarsus, That part of the foot between the tarsus & toes.

Malarix, A double tooth, so named because they grind the food.

Mons, A mount or hill.

Mons Veneris, The eminence immediately over the os pubis in women, that is covered with hair.

OBLIQUUS, Oblique, A term applied to parts from their

Obturator, A stopper up, or that which covers any thing.
Oculus, The eye.

PALMARIS, From *palma*, the hand. Belonging to the hand.

Palpebræ, the eye-lids.

Pericardium, A membranous bag that surrounds the heart.

Periosteum, The membrane which invests the external surface of bones.

Perone, To fasten. A name given to muscles.

Pia mater, The natural mother; so called because it embraces the brain, as a mother folds her child.

Pisiform, From *pisum* a pea, and *forma* likeness. Pea-like.

Pronator, A name given to muscles, the use of which is to turn the palm of the hand downwards.

Psoas, A name given to muscles, that belongs to the loins.

Pterygoid, Resembling the wing of a bird. A name given to a process of the ethmoid bone.

Pudendum, From *pudor* shame. The external parts of generation.

Pulmonary, Belonging to the lungs.

RECTUS, Straight.

Retrahens, To draw back.

Rima glottidis, the opening of the larynx, through which the air passes in and out of the lungs.

Scapha, A sciff, or boat.

Sclerotic, the name of one of the coats of the eye.

Scrobeculus cordis, the pit of the stomach.

Semilunar, Half moon shaped.

Septum, A partition.

Seratus, From *sera*, a saw. Any thing resembling saw teeth.

Squamosa, From *squama*, a scale. A term applied to bones which lie over each other.

Supinator, From *supinus*, upwards. A name given to muscles which turn the palm of the hand upwards.

Supra, Above.

Suture, From *suo*, to join together.

Systole, to contract; the contraction of the heart.

TENSOR, From *tendo*, to stretch. A name given to the muscles.

Teres, Round, cylindrical.

Trachea, the wind pipe, so called from its roughness.

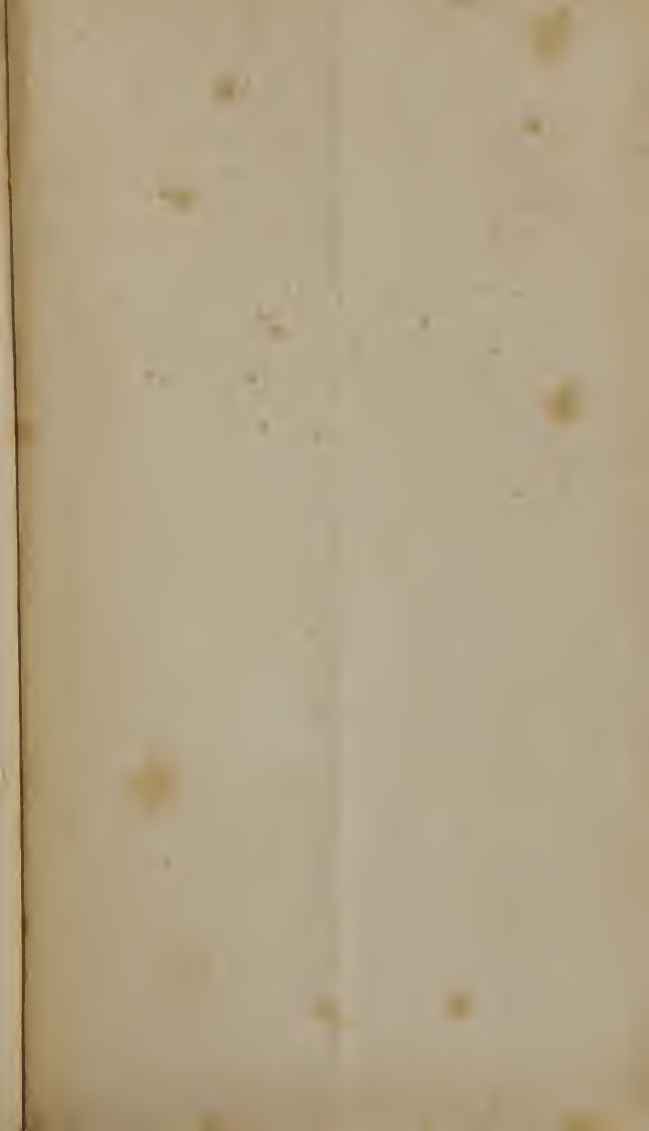
Triceps, From *tres*, three, and *caput*, a head. Three headed.

UVULA, the conical substance which hangs down from the middle of the palate of the mouth.

ZYGOMA, the cavity under the zygomatic process of the temporal bone.

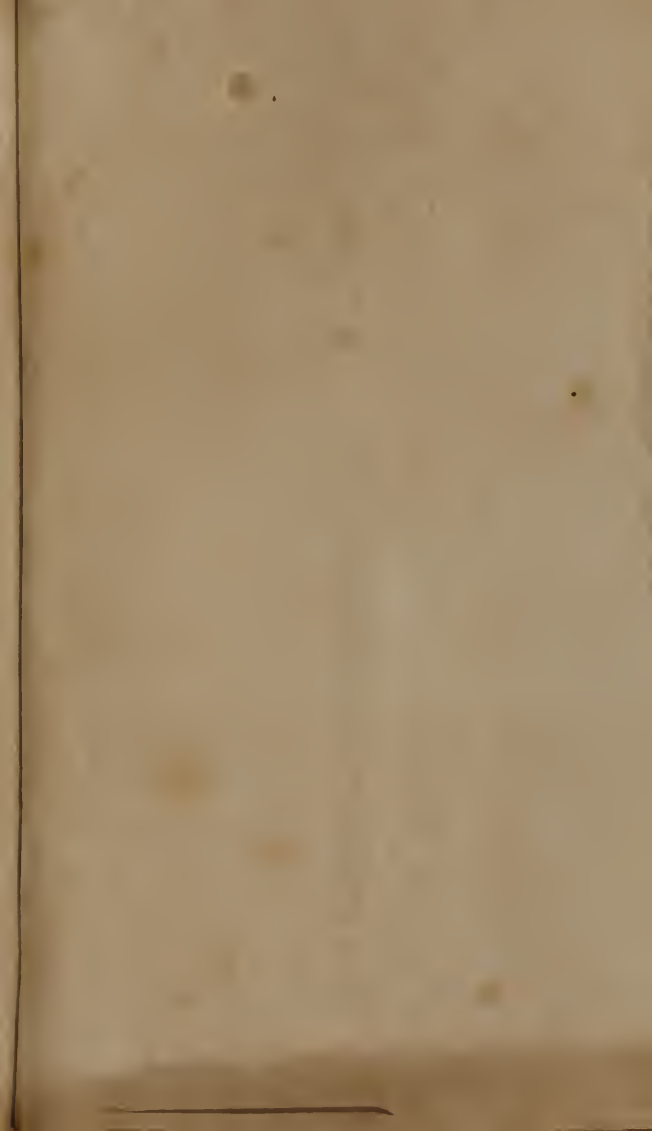














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